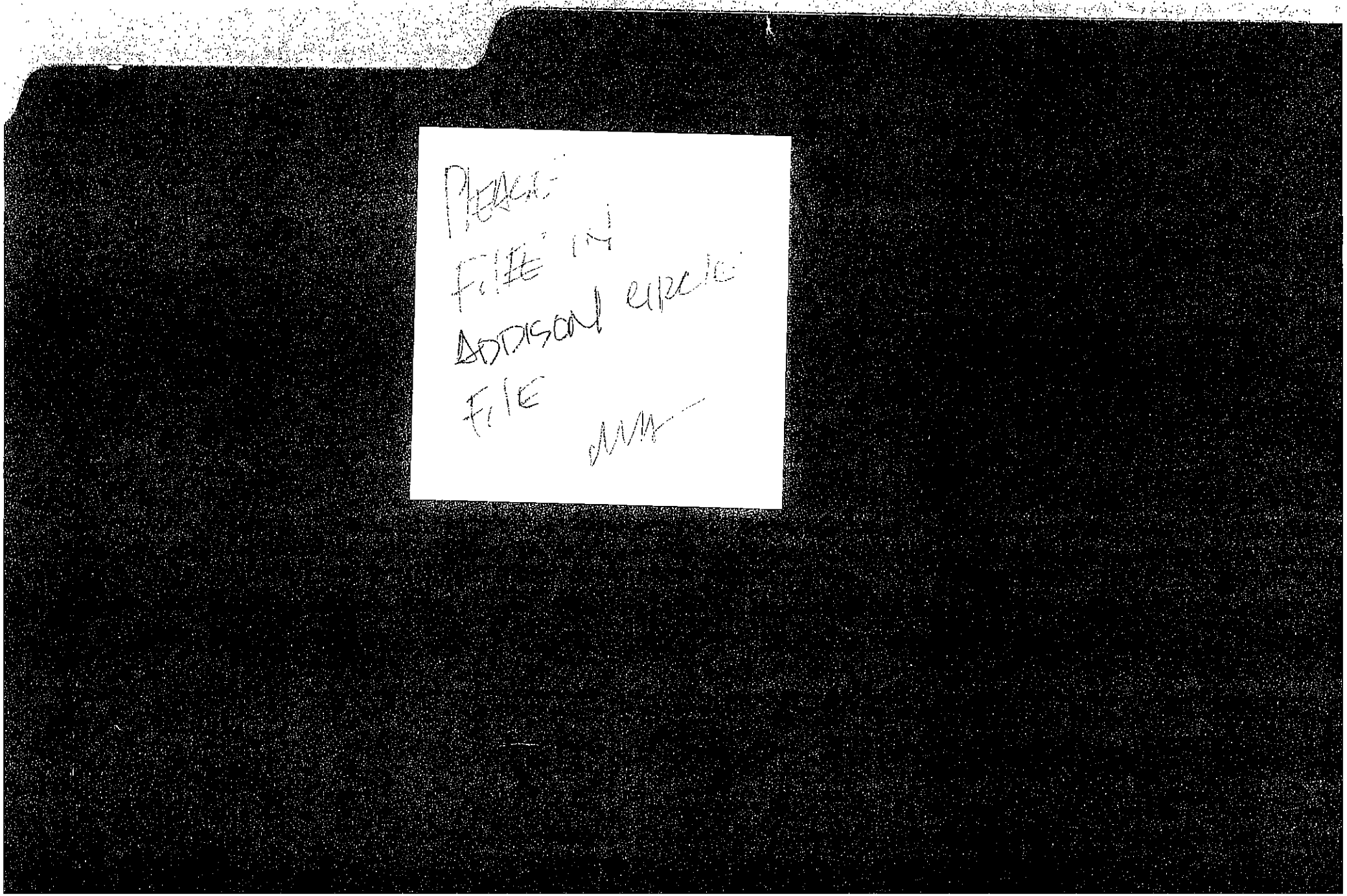
2000-1 Addison Circle

Sasaki re: Paving - 1995



HUITT-ZOLLARS, INC.
3131 McKinney Avenue, Suite 600
DALLAS, TEXAS 75204

(214) 871-3311

LETTER OF TRANSMITTAL

DATE	JOB NO.
6/12/97	01201301

ATTENTION: JOHN BAUMGARTNER

RE: ADDISON CIRCLE

TO TOWN OF ADDISON PUBLIC WORKS
P.O. Box 144
Addison, Tx. 75001

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via MAIL the following items:

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

COPIES	DATE	NO.	DESCRIPTION
1			BRICK INFORMATION.

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit_____copies for approval
☐ For your use ☐ Approved as noted ☐ Submit_____copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return_____corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____ 19_____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS _____

COPY TO _____

SIGNED: David Meyers

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

CONSTRUCTION PROGRESS MEETING NO. 21
Addison Circle Phase I Public Infrastructure
October 23, 1996

PRESENT: See Attached List

LOCATION: Columbus Realty Project Trailer
8:30 a.m.

DISCUSSIONS

1. The Indian Arts Festival will open to the public on October 26 & 27. Fence will go up Wednesday through Friday. A barricade meeting is scheduled for 10:00 a.m. today to coordinate the plan for routing of vehicular and pedestrian traffic. Lone Star Gas will be working on the south side of Mildred Street but they have been informed to have the area restored by the end of the day on Friday. Davis Excavation will remove dirt piles and smooth out ruts on the tract at the southwest corner of the circle. Columbus Realty will arrange for the removal of concrete rubble and backfill of the median in Quorum Drive south of the circle. Columbus Realty needs a release letter signed by the Town instead of the Arts Festival organizers. The large lights on Mildred and Quorum Drive will not be operational for the event, therefore the Town may want to consider additional temporary lighting in some areas.

2. The Mews vehicular and all pedestrian brick has been selected by Columbus and approved by the Town. Gibson and Associates is preparing a price for the new brick.

The brick as selected is the following:

Pedestrian Type "A" - 2-1/4" x 4" x 8" Brown (Glen-Gery)
Pedestrian Type "B" - 2-1/4" x 4" x 8" Autumn Haze (Glen-Gery)
Vehicular Type "A" - 2-5/8" x 4" x 8" Cocoa (Glen-Gery)
Vehicular Type "B" - 2-5/8" x 4" x 8" K & W Old Smokie (Glen-Gery)
Vehicular Type "C" - ACME Brick installed in Mildred and Quorum

Samples of the above mentioned brick are in the Columbus Realty job trailer.

3. The alternate street sign submittal is not yet complete.

g:\proj\0120130i\cnst#21.min

60			5.51	22.09				
	5.47	27.56						
WALL 106 BOARD			1.90	25.66				

4. The mock-up of backflow prevention for water services has been presented to the Town. Due to the configuration of multiple service lines the Town requires a valve be installed on each side of the meter so that each meter can be isolated in the event of a needed repair. This will require a larger rectangular box for the meters instead of the round box previously approved. Tempo is looking into a larger box to be submitted for approval.

5. The Town requires that the deletion of Schedule VIII and the outer ring of trees on the east side of the circle be requested by Columbus Realty in the form of a letter and change order.

6. Columbus should have the light fixture completed on the water tower site within the next couple of weeks. Gibson has not yet restored the permanent irrigation damaged during the construction of the electrical ductbank just north of the Conference Centre parking lot. The Town would like the flex base material replaced on the west side of Building "B" as soon as is practical depending on the schedule of Building "B" construction.

7. There has been no progress on the tagging of trees in Florida. Huitt-Zollars will contact Mr. Gene Newman and determine the status.

A meeting was held on Monday, October 28 with representatives from the Town, Newman Jackson & Bieberstein, Gibson and Associates, Palm Inc., Columbus and Huitt-Zollars to prepare a plan for the tagging of trees and a schedule of when certain trees can be planted based on the Columbus Realty masonry schedule for each building. Paul Shaw will come up with a plan to select the trees in groups depending on availability. Mr. Gene Newman and a representative from Palm are scheduled to tag trees and determine availability of red oaks at Skinner on Wednesday October 30, 1996. It is probable that most of the red oaks of the size and quality required for this project will not be available until next fall. Columbus requires that the red oaks be planted adjacent to their buildings prior to tenant move-in. Gibson and Associates is to complete the sidewalk in all areas that the Columbus schedule will permit. Columbus has contracted to have the tree fence frame installed so that Gibson can install the sidewalk pavers. When the trees are available they will be planted and then the tree fence will be welded to the frame to complete the process. There will be a period of time when sidewalks along Quorum Drive will be complete with 5' x 12' areas of dirt (tree pit locations) flush with the sidewalk until such time that the trees are available for planting.

5.51 22.09

8. **The detectable warning strips will likely be deleted from the Mews. Huitt-Zollars will** prepare revised plans and a change order once a decision is reached.

The detectable warning strips are being deleted from the project and revised plans should be distributed by November 8, 1996.

9. The Town wants Quorum Drive to have one lane closed south of the circle to prevent the sudden transition from two lanes to one lane at the entrance to the roundabout.

10. Erosion control needs to be in place at all inlets especially the drop inlets on the west end of Morris Avenue. Enforcement of erosion control by the EPA is on the rise and noncompliance with the standards could result in fines for the responsible parties.

END OF MEETING

This report is assumed to be a true and accurate account of this meeting unless written notification to the contrary is received within three (3) days. Please distribute these meeting minutes to the appropriate personnel within your respective companies.

SUBMITTED BY:
HUITT-ZOLLARS, INC.

David E. Meyers

David E. Meyers

cc: Bryant Nail, Mark Brandenburg, Jim Duffy-Columbus Realty Trust
Mark Person-Gibson & Associates, Inc.
John Baumgartner, Bruce Ellis, Ron Lee-Town of Addison
Saad Hineidi-Fugro-McClelland, Inc.
Jerry Morgan-Construction Management & Consulting
Paul Shaw-Newman, Jackson & Bieberstein
John Crow, Todd Winters-MTS

g:\proj\01201301\cnst#21.min

PROJECT: ADDISON CIRCLE PHASE I PUBLIC INFRASTRUCTURE DATE: 10/23/96 8:30 A.M.

NAME	COMPANY	TELEPHONE/FAX NOS.
David Meyer	Hewitt-Zouras	871-3311 / 871-0757
Dwight Swindle	MTS	(972)238-4853/783-3099
Mark Brandenburg	CRT	726-0347
Ron Lee	Town of Addison	(972) 450-2863 / 450-2831
Barbara Rosenecut	Addison	972-450-2868 / "
P.L. - Mc	MTS	972-238-4804 / 238-4878
Mark Mark	MTS	972-643-4306
CURT GALBRAITH	MTS	972-783-3070
TODD WINTERS	MTS	972-238-4862
Bruce Ellis	Town of Addison	972-450-2847 / 972-450-2837
Jeff Markiewicz	Town of Addison	972-450-2860
John Baumgarten	" "	972-450-2871
Mark Person	Gibson + Assoc. Inc	972-557-1199 / 557-1552

G:\PROJ\01201301\SIGNIN.SHT

0			5.51	22.09	✓			
	5.47	27.56	✓					
W/CLT 106 BSERVE			1.90	25.66	✓			

STREET BRICK COMPARISON

	Shillington 2-1/4" Modular Paver	Serendipity 2-1/4" Modular Paver	Yorkshire 2-1/4" Modular Paver	Type I, Class SX ASTM C902
Compressive Strength				
Min. Individual	4,710 psi	7,150 psi	7,260 psi	3,500 psi *
Avg. of 5 Brick	6,090 psi	7,510 psi	8,530 psi	4,000 psi *
Modulus of Rupture				
Min. Individual	Not Given	Not Given	Not Given	Not Specified
Avg. of 5 Brick	Not Given	Not Given	Not Given	Not Specified
Cold Water Absorption				
Max. Individual	2.5%	3.0%	4.9%	18% *
Max. Avg. of 5 Brick	2.1%	2.3%	3.8%	16% *
Saturation Coefficient				
Max. Individual	0.49	0.55	0.59	0.80
Max. Avg. of 5 Brick	0.45	0.49	0.54	0.78
Abrasion Index				
Max. Individual	0.051	0.046	0.067	0.11
5 Hr. Boil Absorption				
Max. Individual	5.1%	5.5%	8.4%	13.75% Calculated
Max. Avg. of 5 Brick	4.5%	4.8%	7.1%	10.25% Calculated

* Refer to Section 4.7 of C 902-93 ASTM Standards.

STREET BRICK COMPARISON CONTINUED

Basis for calculated Values in the above table:

Sat Coeff. = 24 Hour Cold Water Absorption/5 Hour Boil Absorption

Abrasion Index = (100 X Absorption)/Compressive Strength

STREET BRICK COMPARISON

	Eureka Brick #230 Mod. Paver	Acme Tulsa HVT Type R	Type R ASTM 1272
Compressive Strength			
Min. Individual	18,940 psi	10,670 psi	7,000 psi
Avg. of 5 Brick	19,890 psi	10,940 psi	8,000 psi
Modulus of Rupture			
Min. Individual	Not Given	1,360 psi	1,000 psi
Avg. of 5 Brick	Not Given	1,520 psi	1,200 psi
Cold Water Absorption			
Max. Individual	4.4%	4.6%	7%
Max. Avg. of 5 Brick	4.2%	4.1%	6%
Saturation Coefficient			
Max. Individual	0.78	Not Given	Not Specified
Max. Avg. of 5 Brick	0.76	Not Given	Not Specified
Abrasion Index			
Max. Individual	0.023 Calculated	0.04	0.11
5 Hr. Boil Absorption			
Max. Individual	5.7%	Not Given	Not Specified
Max. Avg. of 5 Brick	5.6%	Not Given	Not Specified

HUITT-ZOLLARS

Huitt-Zollars, Inc. / Engineering / Architecture / 3131 McKinney Avenue / Suite 600 / LB 105 / Dallas, Texas 75204-2416 / 214-871-3311 / FAX 214-871-0757

May 14, 1996

Mr. John R. Baumgartner, P.E.
Director of Public Works
Town of Addison
16801 Westgrove Drive
P.O. Box 144
Addison, Texas 75001

RE: Addison Circle Phase I
Selection of Brick Pavers
HZI Project No. 01-1822-04

Dear John:

I have been working to resolve the issue of selecting an appropriate brick for use in Addison Circle, taking into account the Town's concerns about serviceability and the developer's desires for a particular feel and appearance. In so doing I have reviewed the various test results versus ASTM specifications and the recommendations that have been made by Sasaki Associates on the Town's behalf. I have also done some research into various brick-making techniques and spoken to several manufacturers, distributors and the Brick Institute of America to try to understand what is important in making this decision. As a result, I have arrived at the following observations and conclusions.

The ASTM C902 specification was developed primarily in response to concerns about freeze-thaw durability of brick pavers. Its requirements for molded brick are not a modified or in any way "relaxed" standard. The specification simply has two sets of parameters for two different but related products; molded brick and extruded brick. The level of performance for any "class" of application or "type" of environment is the same for both materials despite the fact that they may have measurably different compressive strengths and other characteristics. That is, a molded brick (Class SX-Type 1) with a compressive strength of 4000 psi can be equal in performance to an extruded brick of the same class and type but having a compressive strength of 8000 psi because both meet the requirements of their respective parameters in the specification. The extruded brick (such as the Acme paver) is not better just because it has a higher compressive strength. What is more important is the combination of characteristics of each material. Extruded bricks have higher compressive strength because they are more dense. Molded bricks are lighter because they have larger voids. However, if a brick does not have a certain relationship between these parameters it may be subject to deterioration due to freeze-thaw cycles. The very small voids in extruded brick can make them more susceptible to freeze damage than a properly balanced molded brick (i.e., one that meets the C902 limits for molded brick). In addition, if extruded bricks fail, it is generally due to layering that occurs in the extrusion process; a fault that is not present in molded brick. Therefore, no purpose is served by holding a molded brick to the extruded brick limits.

If we were to try to compare a molded brick to an extruded brick, the only approach that I can suggest would be to compare how much each sample exceeds the standards. I do not know if this is meaningful because the progression of individual limits may not be linear in their relationship to durability. However, the Glen-Gery pavers can be compared with the Acme paver in this manner with the following results:

	% of Standard			
	Glen-Gery			Acme
	Shillington	Serendipity	Yorkshire	Sidewalk Paver
Compressive Strength (High)	153%	188%	213%	217%
Cold Water Absorption (Low)	13%	14%	24%	13%
Saturation Coefficient (Low)	58%	63%	69%	86%
Abrasion Index (Low)	46%	42%	61%	Not Reported

The Glen-Gery "Shillington", "Yorkshire" and "Serendipity" pavers far exceed the requirements of ASTM C902-92 SX Type I and are therefore, in our opinion, suitable for consideration for use in the sidewalks at Addison Circle. The Acme paver may be stronger and more durable than the Glen-Gery, however, there are many stronger, more durable pavers available that may not be the most appropriate for this application. The Acme brick was originally proposed because it was the only brick we had identified at that time that met the standards. Even then, it was acknowledged that its appearance was less than desirable in this application. According to the designers and the developer, the Glen-Gery paver suits the aesthetic goals of the district and, according to the test results, it more than meets the specifications for the pedestrian and light vehicular areas.

The selection of a paver for the streets is somewhat more problematic. An ASTM standard has only existed for heavy vehicular paving bricks for less than two years. Prior to the introduction of ASTM C-1272-94, ASTM C902 was used for most public street projects (and probably still is). Huitt-Zollars, Sasaki and many other consultants have specified C902 in applications identical to the proposed streets in Addison for years. The existence of the new standard (coupled with the existence of lawyers) forces us to raise our standards but it does not invalidate the fact that there are scores of examples of brick pavement meeting C902 that is performing well under conditions similar to those to be expected in Addison Circle.

Because ASTM C1272 is relatively new, its applicability has not yet been fully clarified. The specification states that it applies to areas with a "high volume of heavy vehicular traffic" and "such places as streets, commercial driveways and aircraft taxiways". While this statement seems

simple enough, "high volume" and "heavy vehicular traffic" are not defined and there is a huge difference in the conditions to be experienced by the Addison Circle streets and those of an aircraft taxiway. Further investigation reveals that ASTM C1272 is intended for volumes exceeding 1 to 1.5 million total cumulative Equivalent Standard Axle Loads (ESAL). This equates to 30 to 45 eighteen-wheelers or twice as many buses per day based on a 20-year life. Even using a 50-year life it is unlikely that we will see the resultant 12 to 18 trucks or 24 to 36 buses per day on a mews or residential street. On this basis, I believe we have imposed an excessively conservative specification for the street brick and should, in fact, be using C902, not C1272 for the mews and residential streets. I am now convinced that the Glen-Gery Paver is suitable for these street applications for the following reasons.

- It comfortably exceeds the requirements of ASTM C902 for molded brick.
- Durability and serviceability are more a function of the entire paver system than the individual units. We have a very high quality system in the concrete base, asphalt setting bed and rigid edge restraints.
- It has an abrasion index that is well below the limit for even C1272.
- This paver has been used successfully in drives and streets in Grand Rapids, Michigan and Columbus, Ohio, under their severe weather conditions. (See attached letter from Glen-Gery).

One drawback of this paver is that it is not lugged and must therefore be set more carefully so that an appropriate gap exists to brush sand in between the units. A lugged paver does not require as much care from the installer and thus can be laid more quickly (and presumably less expensively for labor).

Based on the projected traffic volumes for Mildred Street and Quorum Drive (10,000 vpd and 30,000 vpd, respectively) and the corresponding estimates of heavy vehicular traffic (1% to 2%), these streets would not fall under ASTM C902 and the more stringent ASTM C1272 standard should apply. Though the Glen-Gery paver could prove to be suitable here as well, I have no technical basis for such a prediction and have no choice but to recommend that another material be submitted that meets C1272. (Unless the developer wants to post an extended maintenance bond using the Glen-Gery paver).

In conclusion, I feel strongly that the Glen-Gery paver meets the letter and intent of our specifications for this project for use in the sidewalks and, now given a better understanding of the applicability of ASTM C1272, I believe the Glen-Gery paver to be suitable for our mews and residential street applications as well. There is no question that more durable bricks (and other materials) exist that could be used on this project. However, the same could be said for any material on almost any project. Durability is only one criterion for selection. We must also consider cost, aesthetics and overall appropriateness for the project application.

I will freely admit that I have reversed my own position on several aspects of this brick controversy but I have done so on the basis of further research. I would be happy to meet with you and Sasaki to discuss this further. You may also feel more comfortable about the objectivity of my conclusions by talking to Mr. Brian Trimble. Mr. Trimble is an engineer with the Brick Institute of America and is current president of ASTM C1502, a Task Group on Clay Paving Brick. He can be reached at (703) 620-0010 in Reston, Virginia.

Sincerely,

HUITT-ZOLLARS, INC.

Andrew C. Oakley, P.E.
Senior Vice President

ACO/bc

Attachment

cc: Bryant Nail

Rec'd 6-24-96

[redacted]
REALTY TRUST

June 11, 1996

Mr. John R. Baumgartner,P.E.
Director of Public Works
Town of Addison
16801 Westgrove Drive
P.O. Box 144
Addison, Texas 75001

Re: Selection of Street and Sidewalk Pavers
Addison Circle Phase I

Dear John:

I am in receipt of your separate letters dated June 4, 1996 responding to our latest submittals for selection of street pavers and sidewalk pavers for Addison Circle wherein you have chosen to use the Acme products which are indicated in the project specifications. I would like to clarify some points regarding the products we have submitted with the hope that you will reconsider your decision.

Both of your letters imply that the project designers, specified Acme brick for this project. As you will recall, we had several discussions about the limitations in public bidding that make it difficult to specify particular products or manufacturers. Columbus has stated from the very beginning that we do not believe the Acme Tulsa pavers have an appearance that is compatible with our vision for the district. The actual specification was for a clay paver that meets ASTM C902 for the sidewalks and a clay paver that meets ASTM C1272 for the streets. Since that time, additional research into the relatively new ASTM C1272 has led the designers to recommend a change to the specification such that a C902 brick is acceptable in the Mews and the Residential streets and a Type "R" brick is acceptable under C1272 for the remaining street applications. The Acme pavers were referenced in the bid documents as a product that was believed to be within the specifications so that the bidders would have a common element upon which to base their bids. It was stated many times that we had no intention of using the Acme brick but because of its properties and cost, it was a safe example to use for bidding until a more appropriate selection could be found. We even went so far as to separate the material cost from the installation cost to facilitate another selection.

With respect to the products we have proposed, we have done a great deal of research and investigation to find both a sidewalk paver and a street paver that achieve our vision for the district and conform to the specifications. The Glen-Gery wood molded bricks are well within the limits of ASTM C902-93 and, despite the statement in your letter, the Endicott Dark Ironspot Paver is well within the limits of ASTM C1272-94. It is an insignificant technicality that the Endicott Paver has not been tested specifically under the parameters of ASTM C1272 when in fact all of these parameters are represented in the

15851 Dallas Parkway Suite 855
Dallas, Texas 75248
214 387-1492 Fax 214 770-5192

test results that were supplies to you. In fact, the Acme paver has not been tested specifically against ASTM C1272 either (see enclosed letter from Acme) and we have not been supplied with data on its modulus of rupture, while we do not have that information on the Endicott street paver.

Concerning the proven durability of the products, especially the wood molded pavers, we have identified many prominent locations where they have been used. I believe it is unfair to say that the applications we have cited are not public applications we have cited are not public applications akin to Addison Circle. Our examples which included Boston City Hall Plaza, Fanieul Hall Marketplace and Harvard Square are used by thousands of people everyday as they go about the business of walking to work, shopping and conducting business. These are not passive recreation areas but are perfect examples of molded brick walkways in the context of pedestrian oriented urban living. You will also note in the attached letter from Acme that they cannot cite any locations where the Tulsa pavers have been in place for any length of time. Despite what the letter says, the first such pavers were installed in late 1990. This is not to imply that the Acme paver is deficient in any way. My point is that there is no more proof that the Acme paver will stand the test of time than there is for the Glen-Gery or the Endicott.

In conclusion, I must reiterate that the pavers we have proposed meet the specifications and meet Columbus's vision for the appearance and ambiance of the district. In addition, as you mentioned in your letters, they are less expensive than the Acme pavers. We cannot let durability be the only consideration in this decision. As with every other element of this project, we must examine durability along with cost, appearance, appropriateness and a host of other considerations if the district is to be a success.

Sincerely,

Bryant Nail
Vice President, Development

cc: Jim Duffy
Ron Whitehead

Fax Cover Sheet

ACME BRICK

Since 1891

Date: 7/10/96

Attention: David E Meyers

Company: Hvit-Zolbas

From: Brad Burks

# of pages: 3
(including this page)

Comments: Copy of test results just finished by Dallas Labs. HVT Paver meets C1272 type R as specified..

This is the actual run we propose to furnish on Addison street circle..

Brad Burks

Please contact our office immediately if you do not receive all of this fax.
Phone 214/241-1400 Fax 214/247-0950

ACME BRICK COMPANY
A Subsidiary of Justin Industries, Inc.
1112 S. SHADY TRAIL - DALLAS, TEXAS 75229 - TEL: 214/241-1400

DALLAS LABORATORIES, INC.

KEVAN W. JONES
VICE PRESIDENT

P.O. BOX 152837
DALLAS, TX 75315
PH.: (214) 565-0593

1323 WALL ST.
DALLAS, TX 75215
FAX (214) 565-1094

TELEPHONE (AREA CODE 214)
[illegible]
[illegible]
421-1480

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1323 WALL ST

DALLAS, TEXAS 75315

CABLE ADDRESS "DALAB"

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AMERICAN SOCIETY FOR QUALITY CONTROL

Submitted by: ACME Brick Company
11261 Shady Trail
Dallas, TX 75229

Attn: Fred Clayton

Date: July 9, 1996

Report No.: 14695

REPORT

Lab Sample No.

14695 Type R Paver Brick (C1272).

RESULTS

Test/Method	Specimen 1	2	3	4	5	Average
Compressive Strength (psi) (ASTM C67)	11,380	10,840	10,745	11,065	10,670	10,940
Modulus of Rupture (psi) (ASTM C67)	1360	1505	1545	1575	1610	1520
Water Absorption (%) (ASTM C67, 5 hr. cold)	4.0	4.0	4.3	3.5	4.6	4.1
Abrasion Index (ASTM C1272)	0.04	0.04	0.04	0.03	0.04	0.04

DALLAS LABORATORIES, INC.

Kevan W. Jones, Vice President

Analyst: K.Jones
KWJ:td

JUL-10-1996 11:37 2145651094 93% P.01

TOTAL P.03

McCreath Laboratories, Inc.

610 WILLOW STREET
HARRISBURG, PENNSYLVANIA 17101
PHONE: 238-9331

Laboratory Test No. EU-002 Date June 16, 1995

To EUREKA BRICK CO.

Brick Identification #230 MOD

The following is a report of Tests on Building Brick conducted in accordance with ASTM Designation C67-94 "Standard Method of Sampling and Testing Brick"

Sample Received 5-22-95 (Date) From CLARKSVILLE AR (Plant) Test Completed June 16, 1995 (Date)

Unit Identification	Compressive Strength (Gross Area/Flatwise)	ABSORPTION			SUCTION RATE	EFFLORESCENCE
		5 Hour Submersion in Boiling Water	24 Hour Submersion in Cold Water	Maximum Saturation Coefficient (Ratio of 24 Hour to 5 Hour)	Oven-Dried Procedure: Gain in Weight in One Minute	(No Efflorescence) Effloresced)
	Pounds Per Square Inch (MPa)	Per Cent	Per Cent		Grams	
	21430 (147.9)	5.5	4.2	0.76	4	No Efflorescence
	20300 (140.1)	5.6	4.4	0.78	3	No Efflorescence
	19010 (131.1)	5.6	4.1	0.74	3	No Efflorescence
	18940 (130.7)	5.7	4.3	0.76	3	No Efflorescence
	19770 (136.4)	5.5	4.2	0.76	4	
AVERAGE	19890 (137.2)	5.6	4.2	0.76	3	

Brick represented by the test results shown here comply with the Standard Specifications (ASTM C32-93) for Sewer Brick (Grades SS, SM) and Manhole Brick (Grades SM), Building Brick (ASTM C62-92c) (Grades SW, MW, NW), Facing Brick (ASTM C216-94a) (Grades SW, MW).

Respectfully submitted,

Similar to Acme Lugged Street Paver

Gary C. Rhinehart

Meets ASTM C1272

Glen-Gery Corporatio
Technical Services/R. arch
Route 61
P.O. Box 340
Shoemakersville, PA 19555
610/562-3076
Fax: 610/562-2084

18 April 1996

Metro Brick
15301 Addison Road
Dallas, Texas 75248

REFERENCE: Addison Circle
Addison, Texas
Contractor: Columbus Realty
Dealer/Distributor: Metro Brick

15301 ADDISON RD. DALLAS, TX 75248

[redacted] METRO [redacted] BRICK [redacted] CO.

* KING SIZE
* WOOD MOLD
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* FIREPLACE EQUIPMENT

BILL SELF
991 - 4488
Pager 413 - 2795
Fax 991 - 6769

To Whom It May Concern,

As requested by our Kansas City Distribution Center, please find enclosed a letter of certification and test report typical of the Shillington Modular Paver Solid (7-5/8" X 3-5/8" X 2-1/4") size units as manufactured by the Iberia Plant of the Glen-Gery Corporation.

Should you require any additional information, please contact the Kansas City Distribution Center. Thank you for your interest in Glen-Gery's line of fine quality products.

Truly yours,

George Robinson.

George Robinson
Director of Technical Services

gr:jy

Enclosures

cc: Kansas City Distribution Center

Brick to be used in Sidewalks and Mews Streets only

610-374-4011 – Ron Hunsicker
[redacted] Jerry Carrier
410-451-1128

Certification : 59000110.DOC

Glen-Gery Corporation
Technical Services/Research
Route 61
P.O. Box 340
Shoemakersville, PA 19555
610/562-3076
Fax: 610/562-2084

18 April 1996

Metro Brick
15301 Addison Road
Dallas, Texas 75248

REFERENCE: Addison Circle
Addison, Texas
Contractor: Columbus Realty
Dealer/Distributor: Metro Brick

To Whom It May Concern,

The Shillington Modular Paver Solid (7-5/8" X 3-5/8" X 2-1/4") size units as manufactured by the Iberia Plant of the Glen-Gery Corporation meet ASTM Designation: C902-93, the Standard Specification for Pedestrian and Light Traffic Paving Brick, Class SX, Type I, Application PS.

Truly yours,

George Robinson.

George Robinson
Director of Technical Services

gr:jy

cc: Kansas City Distribution Center

Glen-Gery Corporati
Corporate Offices
1166 Spring Street
P.O. Box 7001
Wyomissing, PA 19610-6001
610/374-4011
Fax: 610-374-1622

30 April 1996

Andrew Oakley
Huitt-Zollars, Engineers
3131 McKinney Avenue
Suite 600
Dallas, TX 75204
facsimile: 214-871-0757

RE: Glen-Gery Shillington Pavers
3 5/8" X 7 5/8" X 2 1/4"

Dear Mr. Oakley:

Glen-Gery's Shillington Pavers are made at our Iberia, Ohio Factory. This factory was opened in 1990 and has been producing facing brick and paving brick meeting the relevant ASTM standards since that time.

The Shillington Paver is manufactured by the molded process. Characteristic colors and textures are produced by applying different sands to the body of the paver during the time that the clay is being formed into a rectangular solid. Since the body of the paver does not change--particle size distribution, water content, drying conditions, and firing conditions (time-temperature relationships) are all the same--sands are chosen to fire to different colors under the same firing conditions, creating products whose appearance differs but whose physical characteristics are consistent.

Pavers from the Shillington body family have been used on many smaller projects and on two particularly nice large projects--the Gerald Ford Museum in Grand Rapids, Michigan and the exclusive New Albany single-family residential development in Columbus, Ohio. These pavers have been well-received and have performed well in the relatively unforgiving climates found in Grand Rapids and Columbus. Although the Shillington is a relatively new offering, its performance can be predicted from the performance of the other pavers of that body type.

I hope that this satisfies your needs, but if you have any other questions, please give me a call.

Very Truly Yours,
Glen-Gery Corporation

Ronald J. Hunsicker, P.E.
Manager, Architectural Services

McCreath Laboratories, Inc.
610 WILLOW STREET
HARRISBURG, PENNSYLVANIA 17101
PHONE: 238-9331

Laboratory Test No. *IB-789* Date *April 18, 1996*

To *GLEN-GERY CORPORATION*

Brick Identification *SHILLINGTON PAVER 7 5/8 X 3 5/8 X 2 1/4 MOLDED 111260D 110392*

The following is a report of Tests on Building Brick conducted in accordance with ASTM Designation: C67-94 "Standard Method of Sampling and Testing Brick".

Sample Received *04-04-96* (Date) From *IBERIA PLANT* (Plant) Test Completed *April 18, 1996* (Date)

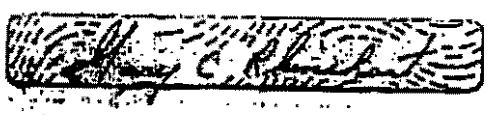
Unit Identification	Compressive Strength (Gross Area/Flatwise)	ABSORPTION			SUCTION RATE	EFFLORESCENCE
		5 Hour Submersion in Boiling Water	24 Hour Submersion in Cold Water	Maximum Saturation Coefficient (Ratio of 24 Hour to 5 Hour)	Oven-Dried Procedure: Gain in Weight in One Minute	(No Efflorescence) Efflorescence
	Pounds Per Square Inch (MPa)	Per Cent	Per Cent		Grams	
1						No Efflorescence
6					*3*	
11	*7090 (48.9)*	*5.1*	*2.5*	*0.49*		
2						No Efflorescence
7					*3*	
12	*5810 (40.1)*	*4.0*	*1.6*	*0.40*		
3						No Efflorescence
8					*3*	
13	*4710 (32.5)*	*4.9*	*2.4*	*0.49*		
4						No Efflorescence
9					*3*	
14	*5750 (39.6)*	*4.8*	*2.3*	*0.48*		
5						No Efflorescence
10					*2*	
15	*7110 (49.1)*	*3.6*	*1.5*	*0.40*		
AVERAGE	*6090 (42)*	*4.5*	*2.1*	*0.45*	*3*	

The brick represented by the test results shown here comply with the Standard Specifications (ASTM C32-93) for Sewer Brick (Grade SM) and Manhole Brick (Grades MS, MM), Building Brick (ASTM C62-92c) (Grades SW, MW, NW), Facing Brick (ASTM C216-94a) (Grades SW, MW) and Pedestrian and Light Traffic Paving Brick (ASTM C902-95) (Classes MX, NX, SX if molded) (Types I, II, III).

Abrasion Index	
11	0.035
12	0.028
13	0.051
14	0.040
15	0.021

Avg. 0.035

Respectfully submitted,



Glen-Gery Corporation
Technical Services/Research
Route 61
P.O. Box 340
Shoemakersville, PA 19555
610/562-3076
Fax: 610/562-2084

1 April 1996

Metro Brick
15301 Addison Road
Dallas, Texas 75248

REFERENCE: Addison Circle
Addison, Texas
Contractor: Columbus Realty
Dealer/Distributor: Metro Brick

To Whom It May Concern,

As requested by our Kansas City Distribution Center, please find enclosed letters of certification and test reports typical of the Serendipity Modular Paver Solid (2-1/4" X 3-5/8" X 7-5/8") and Yorkshire Modular Paver Solid (2-1/4" X 3-5/8" X 7-5/8") size units as manufactured by the Iberia plant of the Glen-Gery Corporation.

In addition you requested a letter of certification and test report typical of the Shillington Modular Paver Solid (2-1/4" X 3-5/8" X 7-5/8"). At the present time, we do not have a test report from which to certify this brick. Our office has requested the plant to send units to McCreath Laboratories for standard testing. As soon as these test results become available, we will forward them to you along with a letter of certification.

If the meantime, should you require any additional information, please contact the Kansas City Distribution Center. Thank you for your interest in Glen-Gery's line of fine quality products.

Truly yours,

George Robinson.

George Robinson
Director of Technical Services

gr:jy

Enclosures

cc: Kansas City Distribution Center

Glen-Gery Corporatio
Technical Services/R. .arch
Route 61
P.O. Box 340
Shoemakersville, PA 19555
610/562-3076
Fax: 610/562-2084

1 April 1996

Metro Brick
15301 Addison Road
Dallas, Texas 75248

REFERENCE: Addison Circle
Addison, Texas
Contractor: Columbus Realty
Dealer/Distributor: Metro Brick

To Whom It May Concern,

The Serendipity Modular Paver Solid (2-1/4" X 3-5/8" X 7-5/8") size units as manufactured by the Iberia Plant of the Glen-Gery Corporation meet ASTM Designation: C902-93, the Standard Specification for Pedestrian and Light Traffic Paving Brick, Class SX, Type I, Application PS.

Truly yours,

George Robinson.

George Robinson
Director of Technical Services

gr:jy

cc: Kansas City Distribution Center

610 WILLOW STREET
HARRISBURG, PENNSYLVANIA 17101
PHONE: 238-0324

RECEIVED
JUN 27 1994

Laboratory Test No. IB-396 Date June 24, 1994

To GLEN-GERY CORPORATION

Brick Identification SERENDIPITY PAVER 7 5/8 X 3 5/8 X 2 1/4 MOLDED 064061 6-3-94

The following is a report of Tests on Building Brick conducted in accordance with ASTM Designation C67-93a "Standard Method of Sampling and Testing Brick"

Sample Received 6-15-94 (Date) From IBERIA (Plant) Test Completed June 24, 1994 (Date)

Unit Identification	Compressive Strength (Gross Area/Flatwise)	ABSORPTION			SUCTION RATE	EFFLORESCENCE
	Pounds Per Square Inch (Newtons)	5 Hour Submersion in Boiling Water, Per Cent	24 Hour Submersion in Cold Water, Per Cent	Maximum Saturation Coefficient (Ratio of 24 Hour to 5 Hour)	Gain in Weight in One Minute, Grams	(No Efflorescence Effloresced)
	8520 (58.8)	4.5	2.0	0.43	10	No Efflorescence
	8970 (61.9)	4.2	1.9	0.46	12	No Efflorescence
	7150 (49.3)	5.5	3.0	0.55	10	No Efflorescence
	7510 (51.8)	4.8	2.3	0.48	8	No Efflorescence
	5390 (37.2)	4.8	2.5	0.51	8	
AVERAGE	7510 (51.8)	4.8	2.3	0.49	10	

Brick represented by the test results shown here comply with the Standard Specifications (ASTM C32-93) for Sewer Brick (Grade SM) and Manhole Brick (Grades MS,), Building Brick (ASTM C62-92c) (Grades SW, MW, NW), Facing Brick (ASTM C216-92d) (Grades SW, MW), and Pedestrian Light Traffic Paving Brick (ASTM C902- (Class(es) MX, NX, SX (If molded) Type I, II, III).

Abrasion Index
0.023
0.021
0.042
0.031
0.046
0.033

Respectfully submitted,

Elaine C. Rhinehart

Glen-Gery Corporation
Technical Services/Research
Route 61
P.O. Box 340
Shoemakersville, PA 19555
610/562-3076
Fax: 610/562-2084

1 April 1996

Metro Brick
15301 Addison Road
Dallas, Texas 75248

REFERENCE: Addison Circle
Addison, Texas
Contractor: Columbus Realty
Dealer/Distributor: Metro Brick

To Whom It May Concern,

The Yorkshire Modular Paver Solid (2-1/4" X 3-5/8" X 7-5/8") size units as manufactured by the Iberia Plant of the Glen-Gery Corporation meet ASTM Designation: C902-93, the Standard Specification for Pedestrian and Light Traffic Paving Brick, Class SX, Type I, Application PS.

Truly yours,

George Robinson

George Robinson
Director of Technical Services

gr:jy

cc: Kansas City Distribution Center

610 WILLOW STREET
HARRISBURG, PENNSYLVANIA 17101
PHONE: 238-9331

RECEIVED
MAR 31

Laboratory Test No. IB-572 Date March 30, 1995

To GLEN-GERY CORPORATION

Brick Identification YORKSHIRE PAVER 3 5/8 X 2 1/4 X 7 5/8 MOLDED 03513D 3-10-95 75% IBERIA SHALE 25% HOLMES SHALE 3 1/2 MESH

The following is a report of Tests on Building Brick conducted in accordance with ASTM Designation C67-93a "Standard Method of Sampling and Testing Brick"

Sample Received 3-21-95 (Date) From IBERIA PLANT (Plant) Test Completed March 30, 1995 (Date)

Unit Identification	Compressive Strength (Gross Area/Flatwise)	ABSORPTION			SUCTION RATE	EFFLORESCENCE
		5 Hour Submersion in Boiling Water	24 Hour Submersion in Cold Water	Maximum Saturation Coefficient (Ratio of 24 Hour to 5 Hour)	Oven-Dried Procedure: Gain in Weight in One Minute	(No Efflorescence) Effloresced)
	Pounds Per Square Inch (MPa)	Per Cent	Per Cent		Grams	
1						No Efflorescence
5					5	
11	8720 (60.2)	6.9	3.6	0.52		
2						No Efflorescence
7					8	
12	8860 (61.1)	5.8	2.8	0.49		
1						No Efflorescence
1					8	
3	7260 (50.1)	8.4	4.9	0.59		
						No Efflorescence
					11	
4	8550 (59)	8.0	4.6	0.58		
						No Efflorescence
0					9	
5	9280 (64)	6.4	3.3	0.51		
AVERAGE	8530 (58.9)	7.1	3.8	0.54	8	

e brick represented by the test results shown here comply with the Standard Specifications (ASTM C32-93) for Sewer Brick (Grade SM) and Manhole Brick (Grades MS, M), Building Brick (ASTM C62-92c) (Grades SW, MW, NW), Facing Brick (ASTM C216-92d) (Grades SW, MW) and Pedestrian and Light Traffic Paving Brick (ASTM 02-93) (Classes SX, MX, NX) (Types I, II, III).

Abrasion Index	
11	0.041
12	0.032
13	0.067
14	0.054
15	0.036
Avg.	0.046

Respectfully submitted,

Gary C. Rhinehart

Bricks
(A)

Glen-Gery Corporation
Technical Services/Research
Route 61
PO Box 340
Shoemakersville, PA 19555
610/562-3076
Fax: 610/562-2084

1 April 1996

Metro Brick
[530] Addison Road
Dallas, Texas 75248

REFERENCE: Addison Circle
Addison, Texas
Contractor: Columbus Realty
Dealer/Distributor: Metro Brick

To Whom It May Concern:

As requested by our Kansas City Distribution Center, please find enclosed letters of certification and test reports typical of the Serendipity Modular Paver Solid (2-1/4" X 3-5/8" X 7-5/8") and Yorkshire Modular Paver Solid (2-1/4" X 3-5/8" X 7-5/8") size units as manufactured by the Iberia plant of the Glen-Gery Corporation.

In addition you requested a letter of certification and test report typical of the Shillington Modular Paver Solid (2-1/4" X 3-5/8" X 7-5/8"). At the present time, we do not have a test report from which to certify this brick. Our office has requested the plant to send units to McCreath Laboratories for standard testing. As soon as these test results become available, we will forward them to you along with a letter of certification.

If the meantime, should you require any additional information, please contact the Kansas City Distribution Center. Thank you for your interest in Glen-Gery's line of fine quality products.

Truly yours,

George Robinson

George Robinson
Director of Technical Services

grjy

Enclosures

cc: Kansas City Distribution Center

Certificates : 52000103 DOC

Glen-Gery Corporation
Technical Services/Research
Route 61
P.O. Box 340
Shoemakersville, PA 19555
610/562-3076
Fax: 610/562-2084

1 April 1996

Metro Brick
15301 Addison Road
Dallas, Texas 75248

REFERENCE: Addison Circle
Addison, Texas
Contractor: Columbus Realty
Dealer/Distributor: Metro Brick

To Whom It May Concern:

The Serendipity Modular Paver Solid (2-1/4" X 3-5/8" X 7-5/8") size units are manufactured by the Iberia Plant of the Glen-Gery Corporation and ASTM Designation: C902-93 the Standard Specification for Pedestrian and Light Traffic Paving Brick, Class SX, Type I, Application PS.

Truly yours,

George Robinson
Director of Technical Services

gr jy

cc: Kansas City Distribution Center

Confirmation: 59000103 HXC

04 01 96 10:27 AM P02

Glen-Gery Corporation
Technical Services/Research
Route 61
P.O. Box 340
Shoemakersville, PA 19555
610/562-3076
Fax: 610/562-2084

1 April 1996

Metro Brick
15501 Addison Road
Dallas, Texas 75248

REFERENCE: Addison Circle
Addison, Texas
Contractor: Columbus Realty
Dealer/Distributor: Metro Brick

To Whom It May Concern,

The Yorkshire Modular Paver Solid (2-3/4" X 3-1/8" X 7-5/8") size units as manufactured by the Iberia Plant of the Glen-Gery Corporation meet ASTM Designation: C902-93, the Standard Specification for Pedestrian and Light Traffic Paving Brick, Class SX, Type I, Application PS

Truly yours,

George Robinson

George Robinson
Director of Technical Services

Enclosure

cc: Kansas City Distribution Center

[redacted] METRO [redacted]
[redacted] BRICK [redacted]
[redacted] [redacted] CO.

YOUR SPECIALTY BRICK SOURCE

15301 ADDISON ROAD DALLAS, TEXAS 75248
(214) 991-4488 FAX (214) 991-8769

April 1, 1996

TO: COLUMBUS REALTY TRUST

ATTN: BRYANT NAIL

FROM: BILL SELF

RE: ADDISON CIRCLE

BRYANT,

ENCLOSED PLEASE FIND THE LETTERS FROM GLEN-GERY STATING THE LAB TEST RESULTS ON THE SERENDIPITY AND YORKSHIRE PAVERS. AT THIS TIME, THEY DO NOT HAVE A TEST REPORT ON THE SHILLINGTON PAVER, BUT AS YOU CAN SEE FROM THEIR LETTERS THEY ARE HAVING THESE TESTED. AS SOON AS THESE RESULTS COME IN, I WILL FORWARD A COPY TO YOU.

THESE ARE THE THREE COLORS THAT WE WILL BE SUPPLYING FOR THE ADDISON CIRCLE STREETS AND SIDEWALKS.

IF YOU HAVE ANY QUESTIONS, OR IF I CAN BE OF FURTHER ASSISTANCE, PLEASE CALL.

THANK YOU.

Bill Self

McCreath Laboratories, Inc.

610 WILLOW STREET
HARRISBURG, PENNSYLVANIA 17101
(PHONE 233-8781)

RECEIVED
JUN 27 1994

Laboratory Test No. IR-326 Date June 24, 1994

To GLEN-GERY CORPORATION

Brick Identification SERENDIPITY PAVER 7 5/8 X 3 7/8 X 2 1/4 MOLDED (6/4/94) 6-7-94

The following is a report of Tests on Building Brick conducted in accordance with ASTM Designation C67-93a "Standard Method of Sampling and Testing Brick"

Sample Received 6-15-94 (Date) From IBERIA (Plant) Test Completed June 24, 1994 (Date)

Unit Identification	Compressive Strength (Gross Area/Flatwise)	ABSORPTION			SUCTION RATE	EFFLORESCENCE
	Pounds Per Square Inch (Newtons)	5 Hour Submersion in Boiling Water, Per Cent	24 Hour Submersion in Cold Water, Per Cent	Maximum Saturation Coefficient (Ratio of 24 Hour to 5 Hour)	Gain in Weight in One Minute, Grams	(No Efflorescence Effloresced)
1						No Efflorescence
6					10	
11	6320 (58.8)	4.5	2.0	0.43		
2						No Efflorescence
7					12	
12	8970 (61.9)	4.2	1.9	0.46		
3						No Efflorescence
8					10	
13	7150 (49.3)	5.5	3.0	0.55		
4						No Efflorescence
9					8	
14	7510 (51.8)	4.8	2.3	0.48		
5						No Efflorescence
10					8	
15	5390 (37.2)	4.8	2.5	0.51		
AVERAGE	7510 (51.8)	4.8	2.3	0.49	10	

The brick represented by the test results shown here comply with the Standard Specifications (ASTM C52-93) for Sewer Brick (Grade SM) and Manhole Brick (Grades MS, MM), Building Brick (ASTM C62-92a) (Grades SW, MW, NW), Facing Brick (ASTM C216-92a) (Grades SW, MW), and Pedestrian Light Traffic Paving Brick (ASTM C902-91) (Classes MX, NX, SX (If marked) Type I, II, III).

	Abrasion Index
1.	0.027
	0.021
	0.042
	0.031
	0.066
Ave.	0.033

Respectfully submitted,

George C. Richardson

McCreath Laboratories, Inc.

610 WILLOW STREET
HARRISBURG, PENNSYLVANIA 17101
PHONE: 234-4731

Laboratory Test No. IB-572 Date March 30, 1995

To GLEN-GERY CORPORATION

Brick Identification YORKSHIRE PAVER 3 5/8 X 7 1/4 X 7 5/8 MOLDED 03513D 3-10-95 75% IBERIA SPALE 25% HOLMES SHALE 3 1/2 MESH

The following is a report of Tests on Building Brick conducted in accordance with ASTM Designation C67-93a "Standard Method of Sampling and Testing Brick"

Sample Received 3-21-95 (Date) From IBERIA PLANT (Plant) Test Completed March 30, 1995 (Date)

Unit Identification	Compressive Strength (Gross Area) Pounds Per Square Inch (MPa)	ABSORPTION 5 Hour Submersion in Boiling Water Per Cent	ABSORPTION 24 Hour Submersion in Cold Water Per Cent	ABSORPTION Maximum Saturation Coefficient (Ratio of 24 Hour to 5 Hour)	SUCTION RATE Oven-Dried Procedure Gain in Weight in One Minute Grams	EFFLORESCENCE (No Efflorescence) Efflorescent
1	8720 (60.2)	6.9	3.6	0.52	5	No Efflorescence
2	8860 (61.1)	5.8	2.6	0.49	8	No Efflorescence
3	7260 (50.1)	8.4	4.9	0.59	8	No Efflorescence
4	8550 (59)	8.0	4.6	0.58	11	No Efflorescence
5	9280 (64)	6.4	3.3	0.51	9	
AVERAGE	8530 (58.9)	7.1	3.8	0.54	8	

The brick represented by the test results shown here comply with the Standard Specifications (ASTM C32-93) for Sewer Brick (Grade SM) and Manhole Brick (Grades MS, MW), Building Brick (ASTM C62-92c) (Grades SW, MW, NW), Facing Brick (ASTM C216-92d) (Grades SW, MW) and Pedestrian and Light Traffic Paving Brick (ASTM C902-93) (Classes SX, MX, NX) (Types I, II, III).

Abrasion Index

11	0.061
12	0.032
13	0.067
14	0.054
15	0.026

Avg. 0.046

Respectfully submitted,

Gary C. Rhoades

ADDENDUM NO. 1

To The Construction Specifications And Contract Documents For

ADDISON CIRCLE
PHASE I
PUBLIC INFRASTRUCTURE

January 17, 1996

CONTRACT DOCUMENTS

SECTION PF - PROPOSAL FORM

Bidders are instructed to make the following changes or additions to the subsection entitled "General Notes and Supplemental Specifications for Bidding".

A. Page PF-3

At the end of the description of "Item No. 117 - Special Paving Enhancements", add the following:

> *Vehicular bricks shall meet or exceed ASTM C67 and ASTM C1272-94 for Heavy Vehicular Paving Brick Type F as referenced in Technical Services Digest #141 bound herein. An acceptable material has been identified as equal to Acme "TULSA" HVT Brick. Brick Type A shall be equal to Acme color " Tulsa Blend 2, Garnet Red". Brick Type B shall be equal to Acme color "Tulsa Blend 20, Amaretto".*

B. Page PF-4

Insert the following description under Bid Schedule II:

> *Item 201 - Brick Paver (Sidewalk)*
>
> *This item consists of specified pedestrian Bricks A & B laid per the patterns in the plans. Note that many dimensions are noted in increments of brick (or "wythe"). Pedestrian Bricks shall meet or exceed ASTM C67 and ASTM C902-92 Class SX Type II. An acceptable material has been identified as equal to Old Virginia Brick Company Oversize, Wood Molded, Frogged Mixed Color #2 pavers. Type A shall be equal to the lightest color variations and Type B shall be equal to the darkest color variations of the same brick.*

PX

C. Page PF-4

At the end of the description under BID SCHEDULE VIII, General, add the following:

> *Bid Schedule VIII is an alternate schedule and is not to be included in the Total Project Base Bid.*

D. Page PF-4

Add the following after BID SCHEDULE VIII:

BID SCHEDULE IX

General

Bid Schedule IX is an alternate schedule and is not to be included in the Total Project Base Bid.

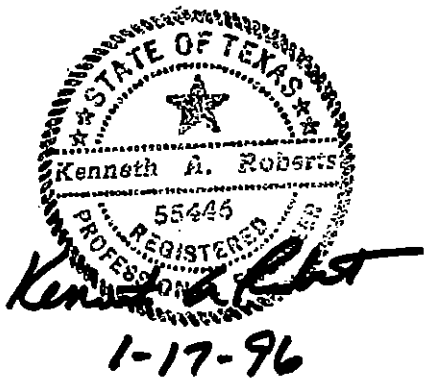
Item 901 - Upgraded Tree Grate

The specified upgraded tree grate shall be equal to Urban Accessories 5 foot SQ OT-T24, unpainted, per the attached catalog cut sheet.

E. Page PF-51

Replace page PF-51 in its entirety with the attached page PF-51 Revised.

END OF ADDENDUM NO. 1



TECHNICAL SERVICES DIGEST 1 NOVEMBER 1994 ACME BRICK Since 1891

SUBJECT: **ASTM SPECIFICATION FOR HEAVY VEHICULAR PAVING BRICK**

A new standard specification for Heavy Vehicular Paving Brick is now available.

This standard is issued under the fixed designation C 1272; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. a superscript epsilon () indicates an editorial change since the last revision or approval.

The standard for Heavy Vehicular Paving Brick was issued in August 1994 with the designation C 1272-94. It is now being sold and distributed by ASTM. This standard complements ASTM C 902 Specification for Pedestrian and Light Traffic Paving Brick. As stated in the scope of this standard, the paving brick are intended for applications receiving a combination of high volumes of heavy vehicles. Although it is not defined in the standard, the intention of the task group was to define "heavy vehicles" as multi-axle trucks, such as tractor-trailer trucks; and "high volumes" as frequent daily truck traffic. One pass of a heavy truck is not considered high volume. Some road design manuals define low volume roads as roads receiving a maximum of 1 to 1.5 million total cumulative Equivalent Standard Axle Loads (ESAL). High volume traffic would be above that number. Applications which this standard would apply include city streets, country roads, industrial pavements, or ports. ASTM C 902 should be used in all other applications such as pedestrian traffic and vehicular traffic restricted to automobile traffic. Service vehicles such as postal and two-axle delivery trucks are not normally considered heavy vehicles.

FRED CLAYTON
DAS 290

1. Scope

1.1 This specification covers brick intended for use as a paving material in areas with a high volume of heavy vehicular traffic. The units are designed for use in such places as streets, commercial driveways, and aircraft taxiways. These units are not intended for applications covered by Specifications C 410 or C 902.

1.2 Units are manufactured from clay, shale, or similar naturally occurring earthy substances and subjected to a heat treatment at elevated temperatures (firing). The heat treatment must develop sufficient fired bond between the particulate constituents to provide the strength and durability requirements of this specification (see firing, fired bond, and incipient fusion in Terminology C 43).

1.3 Brick may be shaped during manufacture by extruding, molding, or pressing. Brick may have spacing lugs, chamfered edges, or both.

1.4 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

2. Referenced Documents

2.1 *ASTM Standards:*

C 43 Terminology of Structural Clay Products[2]

C 67 Test Methods for Sampling and Testing Brick and Structural Clay Tile[2]

C 88 Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate[3]

C 410 Specification for Industrial Floor Brick[2]

C 418 Test Method for Abrasion Resistance of Concrete by Sandblasting[3]

C 902 Specification for Pedestrian and Light Traffic Paving Brick[2]

E 303 Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester[4]

3. Terminology

3.1 *Definitions*—Terms used in this specification are defined in Terminology C 43.

4. Classification

4.1 *Types*—Heavy vehicular paving brick are classified by type according to their intended installation:

4.1.1 *Type R*—Brick intended to be set in a mortar setting bed supported by an adequate concrete base; or an asphalt setting bed supported by an adequate asphalt or concrete base.

4.1.2 *Type F*—Brick intended to be set in a sand setting bed, with sand joints, and supported by an adequate base.

4.2 *Applications*—Heavy vehicular paving brick are classified by application according to their dimensional tolerances, distortion, and extent of chips.

4.2.1 *Application PS*—Pavers intended for general use.

4.2.2 *Application PX*—Pavers intended for use where dimensional tolerances, warpage, and chippage are limited.

4.2.3 *Application PA*—Pavers intended to produce characteristic architectural effects resulting from nonuniformity in size, color, and texture.

5. Physical Requirements

5.1 *Durability*—The brick shall conform to the physical requirements for the type specified as prescribed in Table 1.

5.1.1 *Freezing and Thawing Alternate*—The cold water absorption requirements specified in 5.1 shall not be required provided a sample of five brick, meeting all other requirements, passes the 50 cycle freezing-and-thawing test in Test Methods C 67 with not greater than 0.5 % loss in dry weight of any individual unit.

NOTE 1—The provisions of 5.1.1 are specified only as an alternative when the sample does not conform to the requirements for cold water absorption prescribed in Table 1.

5.1.2 *Sulfate Soundness Test Alternate*—The cold water absorption requirements specified in 5.1 shall not be required if a representative sample of five brick survives 15 cycles of the sulfate soundness test in accordance with Sections 4, 5, and 8 of Test Method C 88 with no visible damage.

NOTE 2—The sulfate soundness test is an optional substitute test for the freezing-and-thawing test (5.1.1).

5.2 *Performance*—If information on the performance over time of similar units in a similar application with similar exposure and traffic is furnished by the manufacturer or the manufacturer's agent and is found acceptable to the specifier of the pavement material or the specifier's agent, the physical requirements in 5.1 or the size requirements in 7.2 shall not be required.

5.3 *Abrasion Resistance*—Each individual brick tested shall meet the requirements of either the Abrasion Index column or the Volume Abrasion Loss column of Table 2.

5.3.1 *Abrasion Index*—The abrasion index is calculated from the cold absorption in percent and the compressive strength in pounds per square inch as follows:

TABLE 1 Physical Requirements

Type	Minimum Compressive Strength, Gross Area, psi (MPa)		Minimum Modulus of Rupture, psi (MPa)		Maximum Cold Water Absorption, %	
	Avg. of 5 Brick	Individual	Avg. of 5 Brick	Individual	Avg. of 5 Brick	Individual
R	8 000 (55.2)	7 000 (48.3)	1 200 (8.3)	1 000 (6.9)	6	7
F	10 000 (69.0)	8 800 (60.7)	1 500 (10.3)	1 275 (8.8)	6	7

TABLE 2 Abrasion Requirements[A]

Type	Abrasion Index, max	Volume Abrasion Loss, max, cm^3/cm^2
R and F	0.11	1.7

[A] See Sections 5.3.1 and 5.3.2 for additional information.

$$\text{abrasion index} = \frac{100 \times \text{absorption}}{\text{compressive strength}}$$

TABLE 3 Tolerances on Dimensions

Dimension, in. (mm)	Permissible Variation, max. ±in. (±mm)		
	Application PS	Application PX	Application PA
3 (76) and under	1/8 (3.2)	1/16 (1.6)	no limit
Over 3 to 5 (76 to 127)	3/16 (4.7)	3/32 (2.4)	no limit
Over 5 to 8 (127 to 203)	1/4 (6.4)	1/8 (3.2)	no limit

TABLE 4 Tolerances on Distortion

Specified Dimension, in. (mm)	Permissible Distortion, max. in. (mm)		
	Application PS	Application PX	Application PA
8 (203) and under	3/32 (2.4)	1/16 (1.6)	no limit
Over 8 (203) to 12 (305)	1/8 (3.2)	3/32 (2.4)	no limit
Over 12 (305) to 16 (406)	5/32 (4.0)	1/8 (3.2)	no limit

TABLE 5 Maximum Permissible Extent of Chippage from Edges and Corners

Application	Chippage, in. (mm) in from	
	Edge	Corner
PS and PX	5/16 (7.9)	1/2 (12.7)
PA	no limit	no limit

5.3.1.1 The compressive strength shall be determined on half-brick, which are the full height (no less than 2¼ in. (57 mm)) and width of the unit, and with a length equal to one half the full length of the unit (±¼ in. (±6 mm) for each dimension). For abrasion index testing purposes, the brick shall be without core holes, frogs or other perforations. Other shaped specimens may be used provided that a correlation is established with the results of the specified shape and the results are converted to be equivalent to those that would be obtained with the specified shape.

5.3.1.2 In those cases where the height requirements for determining compressive strength cannot be met, the abrasion resistance should be determined according to the volume abrasion loss method.

5.3.2 *Volume Abrasion Loss*—The volume abrasion loss should be determined in accordance with Test Method C 418, with the following changes in procedure:

5.3.2.1 The sand shall be a natural silica sand from Ottawa, IL, graded to pass a No. 50 (300-μm) sieve and retained on a No. 100 (150-μm) sieve.

5.3.2.2 The test shall be run on dry brick.

5.3.2.3 The duration of the test shall be 2 min.

5.3.2.4 The rate of sand flow shall be 400 g/min.

5.3.2.5 The volume loss shall be determined by filling the abraded depression with modeling clay, striking off level with the original surface of the brick, and removing and weighing the modeling clay. The volume loss shall be calculated from the bulk density of the modeling clay. The bulk density should be determined on each lot of modeling clay. An alternative method of determining the weight of clay used in filling the sandblast cavity is to determine the weight of the modeling clay sample before and after filling the cavity.

5.4 *Skid Resistance*—When specified, the units shall be tested for skid resistance in accordance with Test Method E 303.

5.5 *Coring*—The brick shall be without core holes or other perforations.

5.6 *Chips or Cracks*—The brick shall be free of chips or cracks larger than those listed in this specification that would significantly impair the performance of the system.

6. Efflorescence

6.1 When specified, the units shall be tested for efflorescence in accordance with Test Methods C 67. The units shall be sampled at the place of manufacture.

7. Dimensions and Permissible Variations

7.1 The size of the brick shall be as specified by the purchaser.

7.2 The minimum thickness of the unit shall depend upon the classification:

7.2.1 *Type R*—2¼ in. (57.2 mm).

7.2.2 *Type F*—2⅝ in. (66.7 mm).

7.3 When chamfers are specified by the purchaser, the dimensions required in 7.2 are exclusive of chamfers. When lugs are specified by the purchaser, the size of the brick and its associated dimensional tolerances shall include the lugs. The lugs shall project no greater than ⅛ in. (3.2 mm), unless otherwise specified.

7.4 In the sample of units, no unit shall depart from the specified size by more than the individual tolerance for the application specified as prescribed in Table 3. Type F paving brick shall conform to Application PX only.

7.5 Tolerances for distortion or warpage of surfaces or edges intended to be exposed in use from a plane surface and from a straight line, respectively, shall not exceed the maximum for the application specified as prescribed in Table 4. Type F paving brick shall conform to Application PX only.

8. Visual Inspection

8.1 Other than chips, the brick shall be free of cracks or other imperfections detracting from the appearance of a designated sample when viewed from a distance of 20 ft (6 m).

8.2 The parts of the brick that will be exposed in place shall be free of chips that exceed the limits given in Table 5. The cumulative length of chips on the exposed face of a single unit shall not exceed 10 % of the perimeter of the exposed face of the brick.

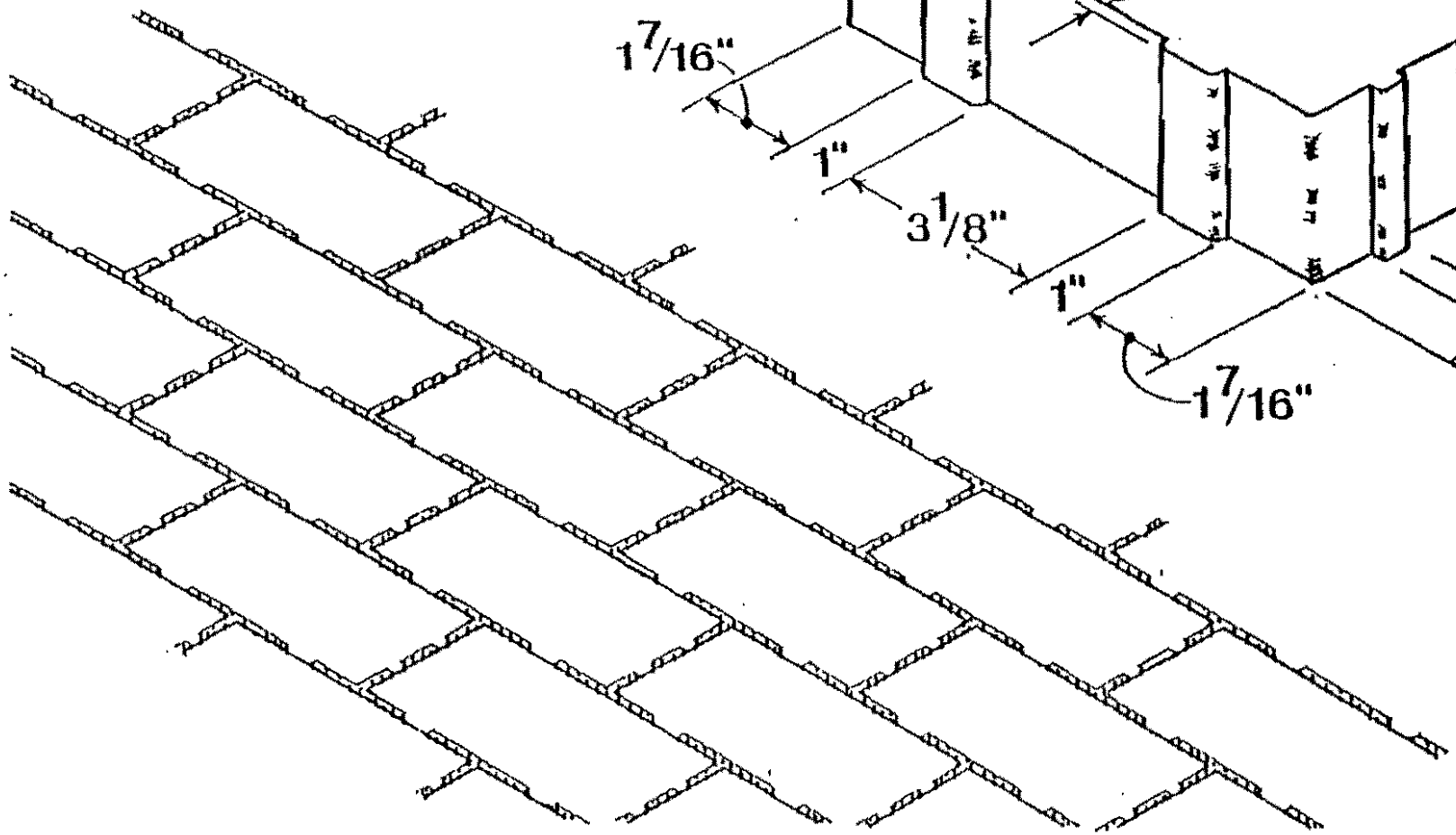
8.3 Unless otherwise agreed upon in writing by the purchaser and the seller, a delivery shall contain not more than 5 % brick that do not meet the combined requirements of Tables 3, 4, and 5, including broken brick.

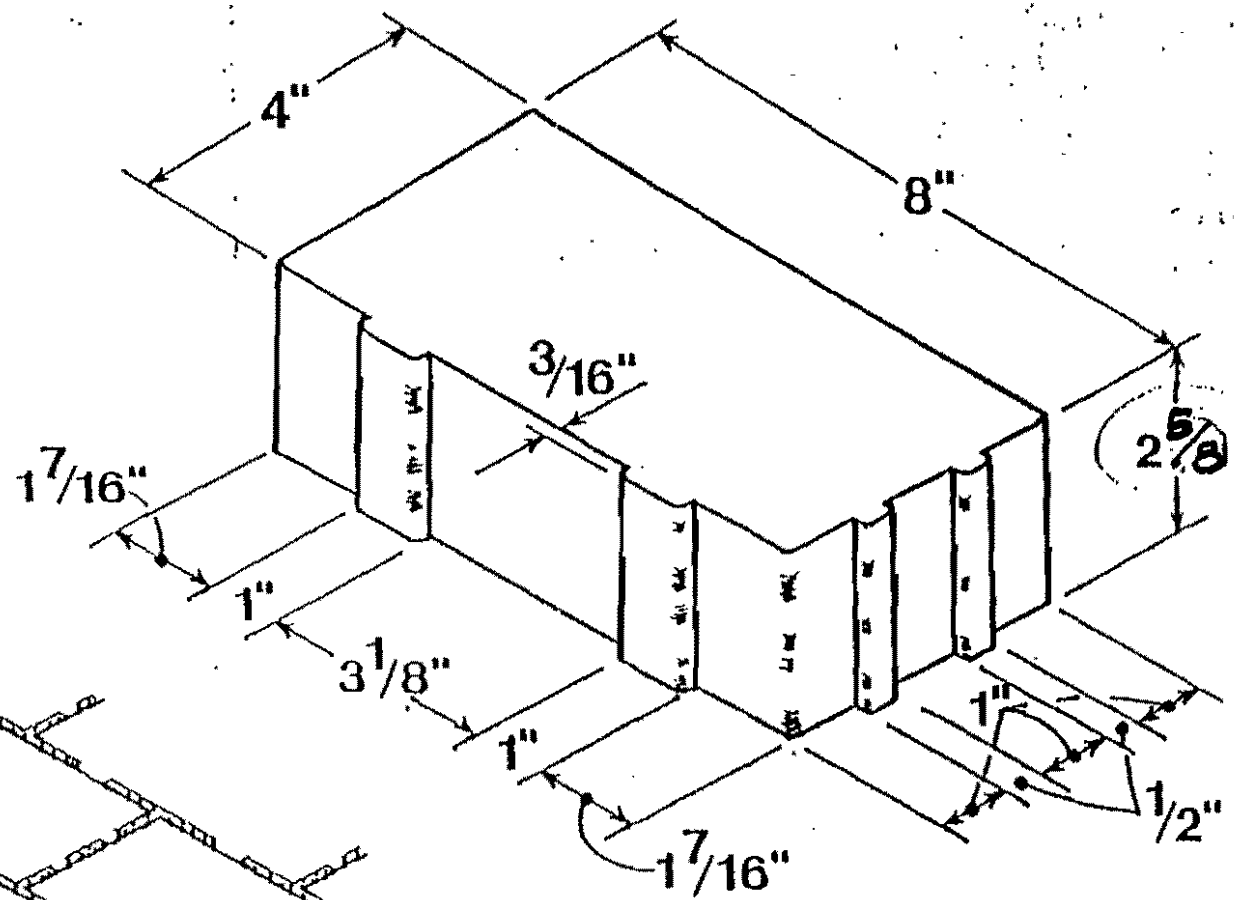
9. Keywords

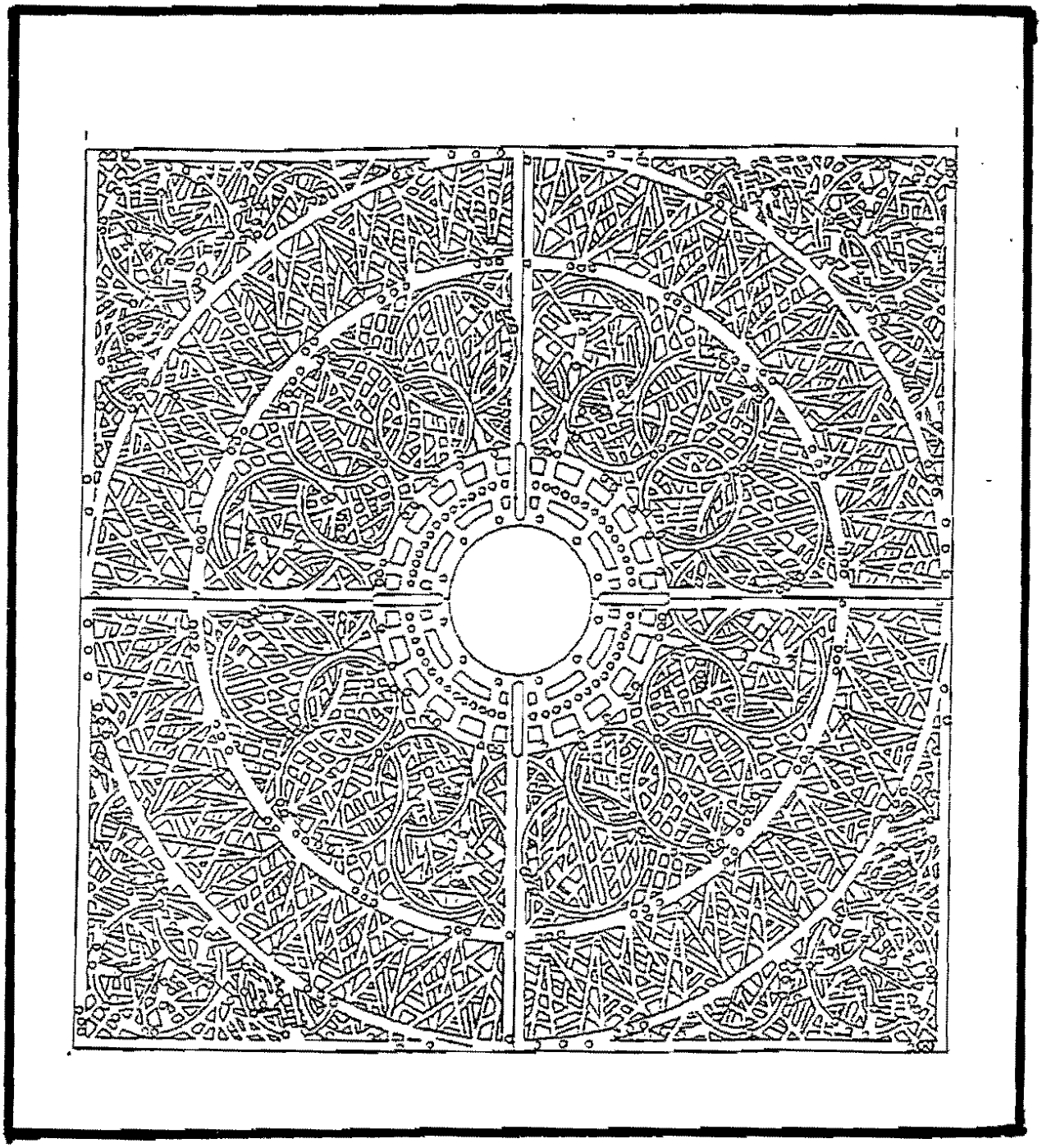
9.1 brick; fired masonry units; pavement surfaces

ACME BRICK

HEAVY VEHICULAR TRAFFIC PAVER







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Professional Service Industries, Inc.

TESTED FOR: Old Virginia Brick Company
P.O. Box 508
Salem, VA 24153

PROJECT: Laboratory Tests of
Wood Molded Paving Brick

DATE: November 14, 1995

OUR REPORT NO.: 455-50091-3

REMARKS:
Old Virginia Brick Company submitted to our laboratory the following brick to be tested in accordance with ASTM C902 and ASTM C67.

Brick Name:	Oversize, Wood Molded, Frogged Mixed Color, #2 Pavers
Nominal Size:	4 x 8 x 2-3/4 inches
Actual Size:	3-1/2 x 7-5/8 x 2-3/4 inches
Grade:	C902, Class SX, Type II

Test results are as follows:

Laboratory Number	Compressive Strength, psi	Cold Water Absorption, %	Five-Hour Boil Absorption, %	Saturation Coefficient	Abrasion Index	Efflorescence Rating
95-1696-A	5980	8.33	11.18	0.75	0.14	None
95-1696-B	5650	6.98	10.23	0.68	0.12	None
95-1696-C	9830	6.48	9.72	0.67	0.07	None
95-1696-D	6040	9.65	13.16	0.73	0.16	None
95-1696-E	5820	7.11	9.96	0.71	0.12	None
Average:	6664	7.80	10.85	0.71	0.12	
Specifications						
Avg. 5 Brick	4000 min.	16.0 max.	—	0.78	0.25	None
Individual	3500 min.	18.0 max.	—	0.80	—	None

Respectfully submitted,
Professional Service Industries, Inc.

Richard B. Crew
Department Manager
Construction Services

RBC/jv

Copies: 4 - Old Virginia Brick Company/Fletcher Smoak

TABLE 4 Tolerances on Dimensions

Specified Dimension, in. (mm)	Maximum Permissible Variation from Specified Dimension, plus or minus, in. (mm)	
	Type FBX	Type FBS
3 (76) and under	1/16 (1.6)	3/32 (2.4)
Over 3–4 (76 to 102), incl	3/32 (2.4)	1/8 (3.2)
Over 4–8 (102 to 152), incl	1/8 (3.2)	3/16 (4.7)
Over 8–8 (152 to 203), incl	5/32 (4.0)	1/4 (6.4)
Over 8–12 (203 to 305), incl	7/32 (5.6)	9/32 (7.9)
Over 12–16 (305 to 406), incl	9/32 (7.1)	5/16 (8.0)

TABLE 5 Tolerances on Distortion

Maximum Face Dimension, in. (mm)	Maximum Permissible Distortion, in. (mm)	
	Type FBX	Type FBS
8 (203) and under	1/16 (1.6)	3/32 (2.4)
Over 8–12 (203 to 305), incl	3/32 (2.4)	1/8 (3.2)
Over 12–16 (305 to 406), incl	1/8 (3.2)	5/32 (4.0)

maximum for the type specified as prescribed in Table 5. Tolerances on distortion for Type FBA shall be as specified by the purchaser.

10. Coring and Frogging

10.1 *Coring*—Unless otherwise specified in the invitation for bids, brick may or may not be cored at the option of the seller. The net cross-sectional area of cored brick in any plane parallel to the bearing surface shall be at least 75 % of the gross cross-sectional area measured in the same plane. No part of any hole shall be less than ¾ in. (19.1 mm) from any edge of the brick.

10.2 *Frogging*—Unless otherwise specified in the invitation for bids, one bearing face of each brick may have a recess or panel frog and deep frogs. The recess or panel frog shall not exceed ⅜ in. (9.5 mm) in depth and no part of the recess or panel frog shall be less than ¾ in. (19.1 mm) from any edge of the brick. In brick containing deep frogs, frogs deeper than ⅜ in. (9.5 mm), any cross-section through the deep frogs parallel to the bearing surface shall conform to the requirements of 10.1.

11. Sampling and Testing

11.1 For purposes of tests, brick that are representative of the commercial product shall be selected by a competent person appointed by the purchaser, the place or places of selection to be designated when the purchase order is placed. The sample or samples shall include specimens representative of the complete range of colors and sizes of the brick supplied or to be supplied. The manufacturer or the seller shall furnish specimens for tests without charge.

11.2 The brick shall be sampled and tested in accordance with Methods C 67.

NOTE 3—Unless otherwise specified in the purchase order, the cost of tests is typically borne as follows: If the results of the tests show that the brick do not conform to the requirements of this specification, the cost is typically borne by the seller. If the results of the tests show that the brick do conform to the requirements of this specification, the cost is typically borne by the purchaser.

EXPLANATORY NOTES

NOTE 1—The effect of weathering on brick is related to the weathering index, which for any locality is the product of the average annual number of *freezing cycle days* and the average annual *winter rainfall* in inches (millimetres), *defined* as follows:*

A Freezing Cycle Day is any day during which the air temperature passes either above or below 32°F (0°C). The average number of freezing cycle days in a year may be taken to equal the difference between the mean number of days during which the minimum temperature was 32°F or below, and the mean number of days during which the maximum temperature was 32°F or below.

Winter Rainfall is the sum, in inches (millimetres), of the mean monthly corrected precipitation (rainfall) occurring during the period between and including the normal date of the first killing frost in the fall and the normal date of the last killing frost in the spring. The winter rainfall for any period is equal to the total precipitation less one tenth of the total fall of snow, sleet, and hail. Rainfall for a portion of a month is prorated.

Fig. 1 indicates general areas of the United States in which brick masonry is subject to severe, moderate, and negligible weathering. The severe weathering region has a weathering index greater than 500. The moderate weathering region has a weathering index of 50 to 500. The negligible weathering region has a weathering index of less than 50. The index for geographic locations near the 50 and 500-in. cycle lines should be determined by analysis of weather bureau local climatological summaries, with due regard to the effect of microclimatic conditions, especially altitude.

NOTE 2—Both laboratory and field investigations have shown that strong and watertight joints between mortar and masonry units are not achieved by ordinary construction methods when the units as laid have excessive initial rates of absorption. Mortar that has stiffened somewhat because of loss of some mixing water to a unit does not make complete and intimate contact with the second unit, resulting in poor adhesion, incomplete bond, and water-permeable joints of low strength. Hence, the initial rate of absorption of the units should be determined by the method described in Section 9 of Methods C 67, if it is not known that it is less than 30 g/min · 30 in.^{2} (30 g/min · 194 cm^2). Units having initial rates of absorption exceeding 30 g/min · 30 in.^{2} should be well wetted prior to laying. They may be wetted immediately before they are laid, but it is preferable to wet them thoroughly 3 to 24 h prior to their use so as to allow time for moisture to become distributed throughout the unit.

NOTE 3—Purchasers should ascertain the type and sizes of brick available in the locality under consideration and should specify accordingly, stating a size and type represented by the available brick. In general, brick having a wide range of colors will require greater tolerance for the full range of colors than for a restricted range of colors.

NOTE 4—For a list of modular sizes, see Test Methods E 389. Not all of the sizes listed in this standard are produced in some parts of the United States, and purchasers should ascertain the size or sizes available.

NOTE 5—When surface colored brick, other than sanded or flashed, are specified for exterior use, the purchaser should require that data be submitted showing that after 50 cycles of freezing thawing there is no

* Data needed to determine the weathering for any locality may be found or estimated from tables of Local Climatological Data published by the National Oceanic and Atmospheric Administration.

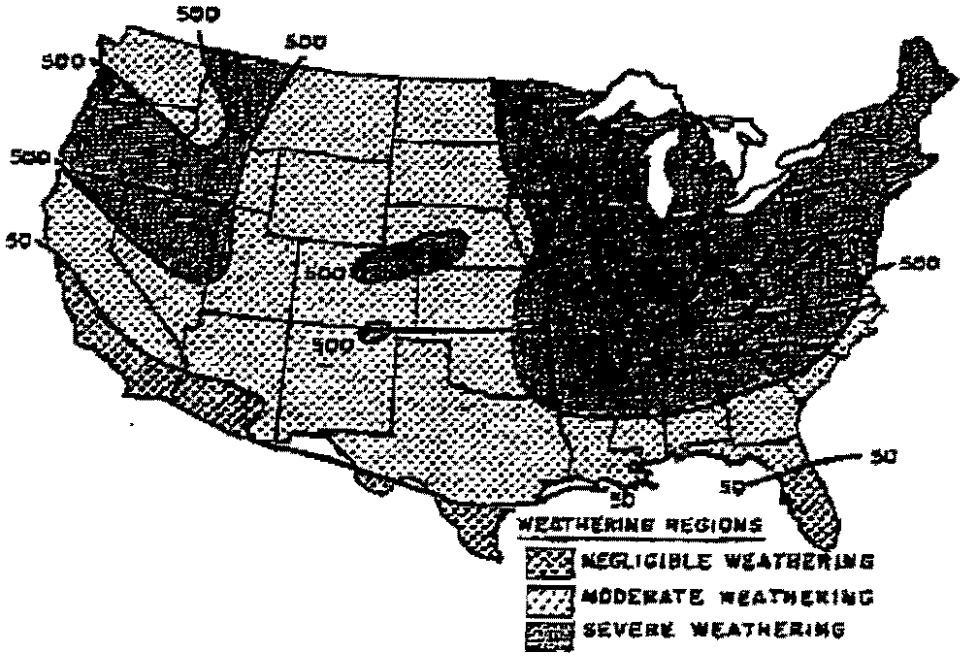

FIG. 1 Weathering Indexes in the United States

observable difference in the applied finish when viewed from a distance of 10 ft (3.0 m) under an illumination of not less than 50 ft-candles (538 lx) by an observer with normal vision.

Service records of the performance of the particular coated brick in exterior locations may be accepted in place of the freezing and thawing test, upon consent of the purchaser.

Designation: C 902 – 89a

Standard Specification for Pedestrian and Light Traffic Paving Brick[1]

This standard is issued under the fixed designation C 902; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers units fired to incipient fusion made from clay, shale, fire clay, or mixtures thereof. The units are intended for use as a paving material to support pedestrian and light vehicular traffic. The units are designed for use in such places as patios, walkways, floors, plazas, and driveways. The units are not intended to support industrial vehicular traffic or for applications covered by Specifications C 7 and C 410.

2. Referenced Documents

2.1 *ASTM Standards:*

C 7 Specification for Paving Brick[2]

C 67 Method for Sampling and Testing Brick and Structural Clay Tile[3]

C 88 Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate[4]

C 410 Specification for Industrial Floor Brick[3]

C 418 Test Method for Abrasion Resistance of Concrete by Sandblasting[4]

3. Classification

3.1 Light traffic paving brick are classified according to the severity of their use-environment. Two types of environment are considered: (*1*) weather and (*2*) traffic:

3.1.1 *Weather:*

3.1.1.1 *Class SX*—Brick intended for use where the brick may be frozen while saturated with water.

3.1.1.2 *Class MX*—Brick intended for exterior use where resistance to freezing is not a factor.

3.1.1.3 *Class NX*—Brick intended for interior use and when an effective sealer, wax, or other suitable surface coating will be applied.

NOTE 1—The function of the surface coating is to prevent penetration of dirt or liquids into the pores of the brick.

3.1.2 *Traffic:*

3.1.2.1 *Type I*—Brick exposed to extensive abrasion, such as in driveways and entranceways to public or commercial buildings.

3.1.2.2 *Type II*—Brick exposed to intermediate traffic, such as floors in restaurants or stores and exterior walkways.

3.1.2.3 *Type III*—Brick exposed to low traffic, such as floors or patios in single-family homes.

4. Physical Requirements

4.1 *Durability*—The brick shall conform to the physical requirements for the class specified as prescribed in Table 1.

4.2 *Performance*—If information on the performance of the units in a similar application of similar exposure and traffic is furnished by the manufacturer or his agent and is found acceptable by the specifier of the pavement material, or his agent, the physical requirements in 4.1 may be waived.

4.3 *Strength and Absorption*—If the average compressive strength is greater than 10 000 psi (68.9 MPa) or the average water absorption is less than 6.0 % after 24-h submersion in room-temperature water, the requirement for saturation coefficient shall be waived.

4.4 *Freezing and Thawing*—The requirements specified in 4.1 and 4.3 shall be waived provided a sample of five brick, meeting all other requirements, passes the freezing and thawing test as described in the Rating section of the Freezing and Thawing procedures of Method C 67.

4.4.1 No breakage and not greater than 0.5 % loss in dry weight of any individual unit.

NOTE 2—The 50 cycle freezing and thawing test is specified only as an alternative when brick do not conform to either Table 1 requirements for maximum water absorption and saturation coefficient, or to the restrictive absorption requirements in 4.3.

4.5 *Sulfate Soundness Test*—The requirements specified in 4.1 may be waived if a sample of five brick survives 15 cycles of the sulfate soundness test in accordance with Sections 3, 4, and 7 of Test Method C 88 with no visible damage.

NOTE 3—The sulfate soundness test is an optional substitute test for the freezing-and-thawing test (4.4).

4.6 *Abrasion Resistance*—The brick shall meet the requirements of either column (1) or (2) of Table 2 for the applicable traffic use (see 3.1.2).

4.7 *Warpage*—The concave or convex warpage of that face of the brick that is to become the floor surface shall not exceed 1/16 in. (1.6 mm) for each 6 in. (150 mm) of brick length when measured in accordance with Section 12 of Methods C 67.

4.8 *Molded Brick* (*Soft Mud, Semi-Dry Pressed, and Dry Pressed Brick*)—The requirements listed in Table 1 shall be changed for molded brick to permit maximum absorption of 16 % average and 18 % individual, and minimum compressive strengths of 4000 psi (27.6 MPa) average and 3500 psi (24.1 MPa) individual for Class SX, provided that the requirements for saturation coefficient of Table 1 are met.

4.9 Unless otherwise specified by the purchaser, brick of

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[1] This specification is under the jurisdiction of ASTM Committee C-15 on Manufactured Masonry Units, and is the direct responsibility of Subcommittee C15.02 on Clay Brick and Structural Clay Tile.

Current edition approved Dec. 14, 1989. Published February 1990. Originally published as C 902 – 79. Last previous edition C 902 – 89.

[2] Discontinued—See *1980 Annual Book of ASTM Standards*, Part 16.

[3] *Annual Book of ASTM Standards*, Vol 04.04.

TABLE 1 Physical Requirements[A]

Designation	Compressive Strength, flatwise, gross area, min, psi (MPa)		Cold Water Absorption, max, %		Saturation Coefficient, max[B]	
	Average of 5 Brick	Individual	Average of 5 Brick	Individual	Average of 5 Brick	Individual
Class SX	8000 (55.2)	7000 (48.3)	8	11	0.78	0.80
Class MX	3000 (20.7)	2500 (17.2)	14	17	no limit	no limit
Class NX	3000 (20.7)	2500 (17.2)	no limit	no limit	no limit	no limit

[A] Minimum modulus of rupture values should be considered by the purchaser for uses of brick where support or loading may be severe.
[B] The saturation coefficient is the ratio of absorption by 24-h submersion in room temperature water to that after 5-h submersion in boiling water.

TABLE 2 Abrasion Requirements[A]

NOTE 1—The abrasion index is calculated from the cold absorption in percent and the compressive strength in pounds per square inch as follows:

$$\text{Abrasion index} = \frac{100 \times \text{absorption}}{\text{compressive strength}}$$

Compressive strength values are influenced by specimen shape (particularly the height to width ratio of the test specimen). Therefore, a shape is specified which conforms to the data on which the abrasion index is based.[3]

The compressive strength shall be determined on specimens measuring 3⅞ by 3⅞ by 2¼ in. ± ⅛ in. (98 by 98 by 57 mm ± 3 mm) for length, width, and height respectively. The brick shall be without core holes, other perforations or frogs. Other shaped specimens may be used provided that the producer submits evidence acceptable to the purchaser that the change in shape gives equivalent strength results to those of the specified shape.

The abrasion resistance should be determined according to Note 2 in those cases where the procedural requirements for compressive strength cannot be met.

NOTE 2—The volume abrasion loss should be determined in accordance with Method C 418, with the following changes in procedure:

(1) The sand shall be a natural silica sand from Ottawa, Ill., graded to pass a No. 50 (300-μm) sieve and retained on a No. 100 (150-μm) sieve.

(2) The test shall be run on dry brick.

(3) The duration of the test shall be 2 min.

(4) The rate of sand flow shall be 400 g/min.

(5) The volume loss shall be determined by filling the abraded depression with modeling clay, striking off level with the original surface of the brick, and removing and weighing the modeling clay. The volume loss will be calculated from the bulk density of the modeling clay. The bulk density should be determined on each lot of modeling clay.

An alternative method of determining the weight of clay used in filling the sand-blast cavity is to determine the weight of the modeling clay sample before and after filling the cavity.

	(1)[B] Abrasion Index, max	(2)[B] Volume Abrasion Loss, max, cm³/cm²
Type I	0.11	1.7
Type II	0.25	2.7
Type III	0.50	4.0

[A] Skid/slip resistance should be considered by the purchaser for uses of brick where pedestrian traffic is anticipated. Methods of testing this characteristic are under study and it is hoped that a specification for this property can be added in future revisions of this standard when suitable test methods are developed.
[B] The brick should meet the requirements of either column (1) or (2).

and Class SX shall be accepted instead of Class MX. Surface coatings will not be required of Classes SX and MX when used instead of Class NX. Types I and II shall be accepted instead of Type III, and Type I shall be accepted instead of Type II.

5. Efflorescence

5.1 When paving brick are tested in accordance with Section 10 of Methods C 67, the rating for efflorescence shall be: "not effloresced."

6. Size

6.1 The size of the brick shall be as specified by the purchaser or produced by the manufacturer as a stock item.

6.2 The tolerance on dimension shall depend on the bond pattern and method of installation of the units. Three different methods of applications are covered:

6.2.1 *Application PS*—Floor and patio brick intended for general use and installed with a mortar joint between individual units, or in an installation without mortar joints between units when they are laid in running or other bonds not requiring extremely close dimensional tolerances.

6.2.2 *Application PX*—Floor and patio brick intended for installation without mortar joints between the units, where exceptionally close dimensional tolerances are required as a result of special bond patterns or unusual construction requirements.

6.2.3 *Application PA*—Floor and patio units manufactured and selected to produce characteristic architectural effects resulting from nonuniformity in size, color, and texture of individual units. (The textures may exhibit inclusion of nonuniform nodules of mineral substances or purposely introduced cracks that enhance the appearance of the units.) The requirements on warpage as specified in 4.7 do not apply to this application.

6.3 When the application is not specified, the requirements for Application PS shall govern.

7. Visual Inspection

7.1 The brick shall be free of cracks or other imperfections

TABLE 3 Maximum Permissible Extent of Chippage from Edges and Corners

NOTE—The aggregate length of chips on a single unit shall not exceed 10 % of the perimeter of the exposed face of the brick.

Application	Chippage in Inches (Millimetres) in from	
	Edge	Corner
PS	5/16 (7.9)	½ (12.7)
PX	¼ (6.4)	⅜ (9.5)
PA	as specified by purchaser	

TABLE 4 Tolerances on Dimensions

Dimension, in. (mm)	Permissible Variation, max, plus or minus in. (mm)	Variation from Specified Dimension, in. (mm)	
	Application PS	Application PX	Application PA
3 (76) and under	⅛ (3.2)	1/16 (1.6)	no limit
Over 3 to 4 (76 to 102) incl	3/16 (4.7)	3/32 (2.4)	no limit

[3] McBurney, J. W., Brink, R. H., Eberle, A. R., "Relation of Water Absorption [illegible]

detracting from the appearance of a designated sample when viewed from a distance of 15 ft (4.6 m) for Application PX and a distance of 20 ft (6 m) for Application PS.

7.2 The parts of the brick that will be exposed in place shall be free of chips that exceed the limits given in Table 3.

7.3 Unless otherwise agreed upon by the purchaser and the seller, a delivery of brick shall contain not more than 5 % brick that do not meet the combined requirements of Tables 2, 3, and 4, and including broken brick.

EXPLANATORY NOTE

Durability—The resistance of brick to weathering cannot be predicted with complete assurance at the present state of knowledge. There is no known test that can predict weathering resistance with complete accuracy.

Brick in general is superior in weathering resistance to other building materials. There are innumerable instances of satisfactory performance beyond 200 years and even into the thousands of years. Nevertheless, there are some brick that cannot survive a few winters of a severe freezing and thawing environment.

The durability requirements of the specification attempt to exclude such brick. This specification utilizes the best knowledge available at this time and is based on extensive research by several investigators. The durability requirements have an excellent correlation with in-use performance. Nevertheless, it is known that some brick that meet this specification may not be serviceable in severe climates. Furthermore, other brick that do not meet these specifications may show superior serviceability in the most severe climate. The best indication of brick durability is its service experience record.

Designation: C 216 – 88

Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale)[1]

This standard is issued under the fixed designation C 216; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense. Consult the DoD Index of Specifications and Standards for the specific year of issue which has been adopted by the Department of Defense.

1. Scope

1.1 This specification covers brick intended for use in masonry and supplying structural or facing components, or both, to the structure.

1.2 The brick are prismatic units available in a variety of sizes, textures, colors, and shapes. This Specification is not intended to provide specifications for paving brick (see Specification C 902).

1.3 Brick are manufactured from clay, shale, or similar naturally occurring earthy substances and subjected to a heat treatment at elevated temperatures (firing). The heat treatment must develop a fired bond between the particulate constituents to provide the strength and durability requirements of this Specification (see firing, fired bond, and incipient fusion in Definitions C 43.)

1.4 Brick may be shaped during manufacture by molding, pressing, or extrusion, and the shaping method may be used to describe the brick.

1.5 Three types of brick in each of two grades are covered.

1.6 The values stated in inch-pound units are to be regarded as the standard.

2. Referenced Documents

2.1 *ASTM Standards:*

C 43 Definitions of Terms Relating to Structural Clay Products[2]

C 67 Methods of Sampling and Testing Brick and Structural Clay Tile[2]

C 902 Specification for Pedestrian and Light Traffic Paving Brick[2]

E 385 Test Method for Oxygen Content Using a 14-Mev Neutron Activation and Direct-Counting Technique[3]

3. Grades

3.1 Two grades of facing brick are covered for the exposures to weather defined in Table 1.

4. Types

4.1 Three types of facing brick are covered:

4.1.1 *Type FBS*—Brick for general use in exposed exterior and interior masonry walls and partitions where wider color ranges and greater variation in sizes are permitted than are specified for Type FBX.

4.1.2 *Type FBX*—Brick for general use in exposed exterior and interior masonry walls and partitions where a high degree of workmanship perfection, narrow color range, and minimum permissible variation in size are required.

4.1.3 *Type FBA*—Brick manufactured and selected to produce characteristic architectural effects resulting from nonuniformity in size, color, and texture of the individual units.

4.2 When the type is not specified, the requirements for Type FBS shall govern.

5. Physical Properties

5.1 *Durability*—The brick shall conform to the physical requirements for the grade specified as prescribed in Table 2. When the grade is not specified, the requirements for Grade MW shall govern. Unless otherwise specified by the purchaser, brick of Grade SW shall be accepted instead of Grade MW. The saturation coefficient requirement shall be waived provided the average cold water absorption of a random sample of five brick does not exceed 8 %, no more than one brick of the sample exceeds 8 % and its cold water absorption must be less than 10 %. If brick are intended for use exposed to weather where the weathering index is less than 50 (see Explanatory Note 1 and accompanying Fig. 1), unless otherwise specified the requirements for water absorption (5-h boiling) and for saturation coefficient shall be waived.

5.2 *Freezing and Thawing*—The requirements specified in 5.1 for water absorption (5-h boiling) and saturation coefficient shall be waived provided a sample of five brick, meeting all other requirements, passes the freezing and thawing test as described in the Rating section of the freezing and thawing procedures of Methods C 67:

Grade SW — no breakage and not greater than 0.5 % loss in dry weight of any individual brick.

NOTE 1—The 50 cycle freezing and thawing test is specified only as an alternative when brick do not conform to either Table 2 requirements for maximum water absorption and saturation coefficient, or to the respective absorption requirements in 5.1.

5.3 *Strength*—When brick are required having strengths greater than prescribed by this specification, the purchaser shall specify the desired minimum compressive strength.

5.4 *Rate of Absorption*—See Explanatory Note 2.

6. Efflorescence

6.1 When the brick are tested in accordance with Methods

END

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[1] This specification is under the jurisdiction of ASTM Committee C-15 on Manufactured Masonry Units and is the direct responsibility of Subcommittee C15.02 on Clay Brick and Structural Clay Tile.

Current edition approved Dec. 14, 1988. Published February 1990. Originally published as C 216 – 66. Last previous edition C 216 – 82a.

[2] *Annual Book of ASTM Standards*, Vol 04.05.

[3] *Annual Book of ASTM Standards*, Vol 12.02.

BITUMINOUS SPECIFICATIONS
BRICK PAVERS

I. MATERIALS

A. BRICK PAVERS

The pavers are to be manufactured from extruded fireclay or shale and shall be fired to produce a dense paver with an average absorption of less than 4% (in a 24 hour cold-water absorption test) and have an average compressive strength of not less than 10,500 lbs. per square inch for any five bricks tested. The pavers must be capable of withstanding at least the equivalent of 100 cycles of freeze-thaw conditions. The permissible tolerance for individual pavers shall conform to ASTM Designation C-216 Type F.B.S.

B. BITUMINOUS SETTING BED

Asphalt cement to be used in the bituminous setting bed shall conform to ASTM Designation D-946-69A with a penetration at 77 degrees F. 100G., 5 sec. of minimum 85 millimeters and a maximum of 100 millimeters.

The fine aggregate to be used in the bituminous setting bed shall be clean, hard sand with durable particles and free from adherent coatings, lumps of clay, alkali salts, and organic matter. It shall be uniformly graded from "coarse" to "fine" and all passing the No. 4 sieve and meet the gradation requirements when tested in accordance with the standard method of test for sieve or screen analysis for fine and coarse aggregates ASTM Designation C-136-67. The dried fine aggregate shall be combined with hot asphalt cement, and the mix shall be heated to approximately 300 degrees F. at an asphalt plant. The approximate proportion of materials shall be seven (7) percent cement asphalt and ninety-three (93) percent fine aggregate. Each ton shall be apportioned by weight in the approximate ratio 145 lbs. asphalt to 1,855 lbs. sand. The contractor shall determine the exact proportions to produce the best possible mixture for construction of the bituminous setting bed to meet construction requirements.

C. NEOPRENE-MODIFIED ASPHALT ADHESIVE

Shall consist of two (2) percent neoprene (grade WM1) oxidized asphalt with a 155 degree softening point, (30 penetration) and ten (10) percent long fibered [redacted].

D. JOINT FILLER

Portland cement to which pigments have been added shall conform to ASTM C-150. Sand shall conform to ASTM C-33.

II. APPLICATION

A. PLACING BITUMINOUS SETTING BED

To install the setting bed over the surface of the base, place 3/4 inch deep control bars directly over the base. If grades must be adjusted, set wood chocks under depth control bars to proper grade. Set two bars parallel to each other approximately eleven (11) feet apart to serve as guides for striking board (12 ft. long 2 in. x 6 in. board). The depth control bars must be set carefully to bring the pavers, when laid, to proper grade. Place some bituminous bed between the parallel depth control bars. Pull this bed with the striking board over these bars several times. After each passage, low porous spots must be showered with fresh bituminous material to produce smooth, firm and even setting bed. As soon as this initial panel is completed, advance the first bar to the next position in readiness for striking the next panel. Carefully fill up any depressions that remain after removing the depth control bars and wood chocks. The setting bed shall be rolled while hot with a power roller to nominal depth of 3/4 of an inch.

The elevation shall be adjusted so that when the bricks are placed, the top surface of the pavers will be the required finished grade.

A coating of two (2) percent neoprene-modified asphalt adhesive shall be applied by mopping or squeegeeing or troweling over the top surface of the bituminous setting bed so as to provide a bond under the pavers. If it is troweled, the trowel shall be serrated with serrations not to exceed one-sixteenth (1/16) of an inch.

B. INSTALLATION OF BRICK PAVERS

When the modified asphalt adhesive is dry to the touch, carefully place the pavers by hand in straight courses with hand tight joints and uniform top surface. Good alignment must be kept, and the pattern shall be that shown on the plans. Newly laid pavers must be protected at all times by panels of plywood on which the installer stands. These panels of plywood can be advanced as work progresses. However, the plywood protection must be kept in areas which will be subjected to continued movement of materials and equipment. These precautions must be taken in order to avoid depressions and protect paver alignment. If additional leveling of the pavers is required, and before sweeping in joint filler, roll with a power roller after sufficient heat has built up in the surface from several days of hot weather.

B. BASE

A four (4) inch deep concrete slab is the preferred base course, or a four (4) inch deep binder mix, mixed in an asphalt plant in accordance with state or local highway specifications. To aid drainage, construct French Drains in slab by placing 2" diameter sleeves at low points of slab while it is being poured. (Sleeves should be filled with gravel.) These are required if poured concrete divider grid is part of design pattern.

C. VEHICULAR TRAFFIC

Prime concrete slab or binder course with rapid curing cut back asphalt (M-81) if there is to be vehicular traffic over Brick Pavers.

D. CURBS

Curbs are required to retain pavers. Either poured concrete, granite blocks, steel or suitable pre-cast material should be used. Set curbs to the same finished elevation as the top of the pavers.

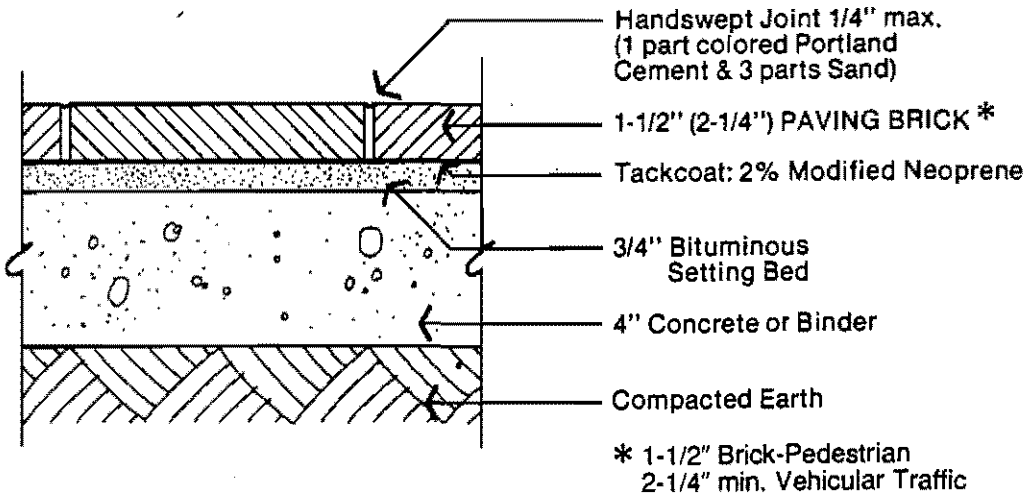
C. JOINT TREATMENT

Hand Tight joints (shall read from 0" to maximum 1/4"). Sweep a dry mixture of one part colored Portland cement to match color of brick pavers and three parts sand until joints are completely filled. Fog lightly with water. Cement stains that remain should be cleaned with a 10% solution of muriatic acid or mortar cleaner, or sweep with moist sand.

III. OTHER CONDITIONS

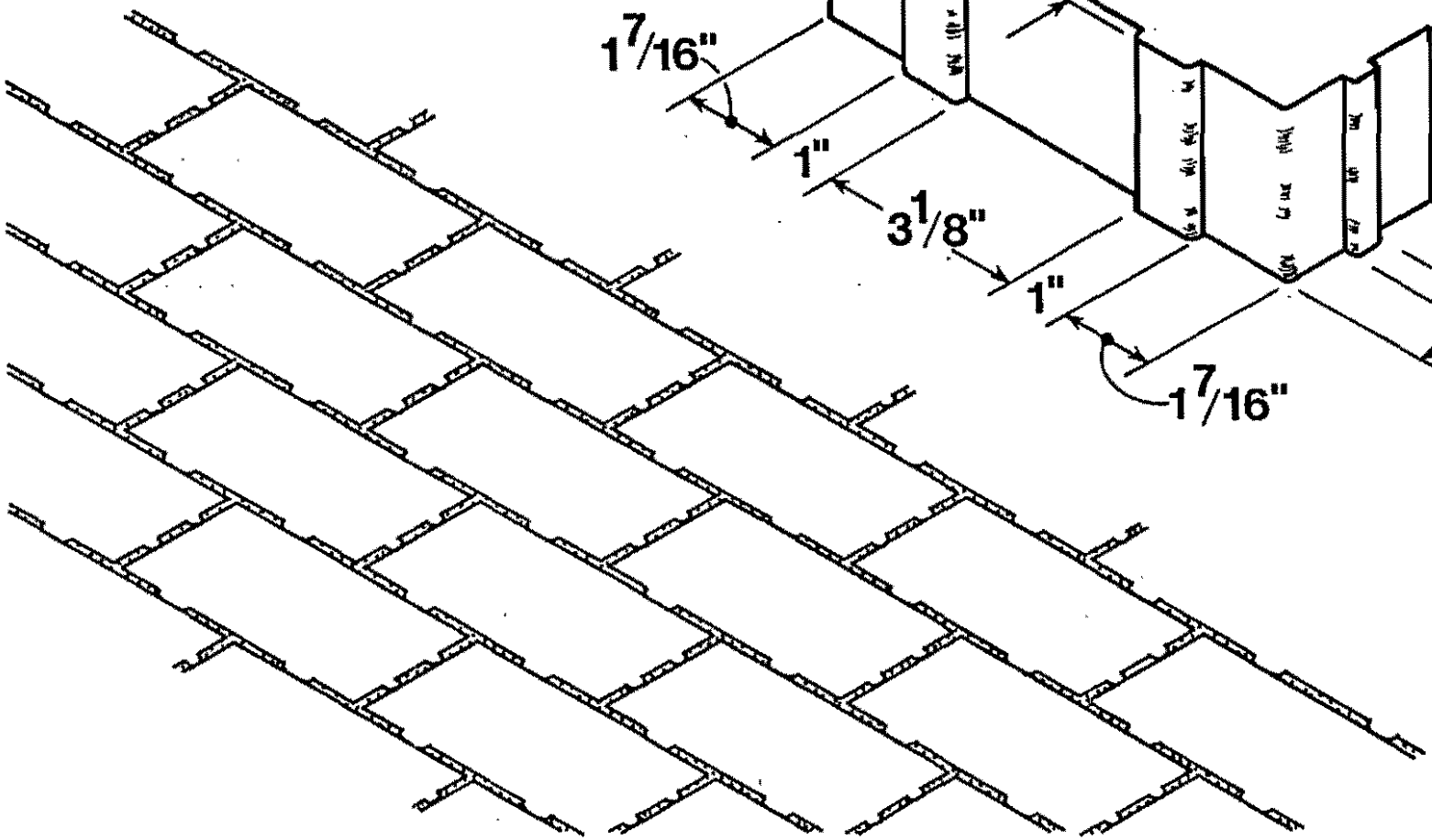
A. EXPANSION JOINTS ON ROOF DECK (for Hand Tight Joints only)

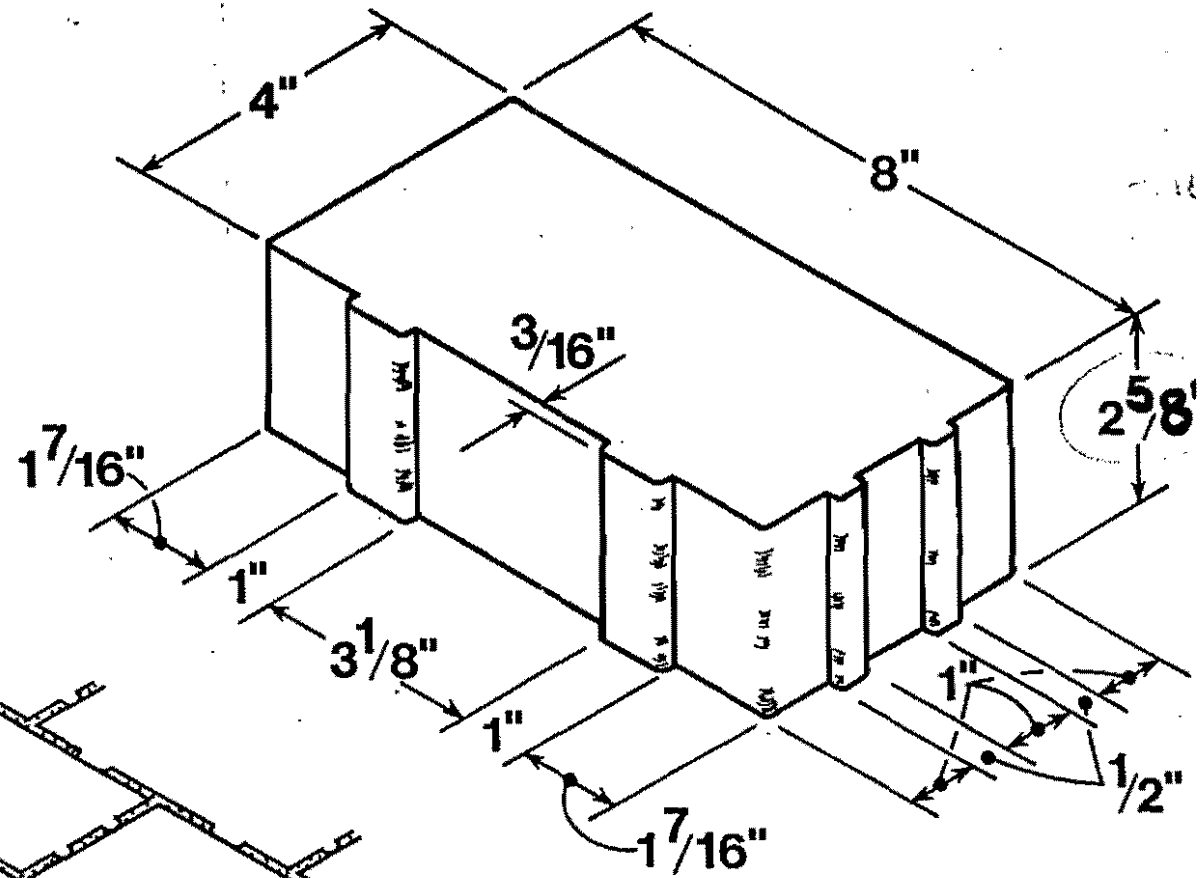
Place a premoulded nonextruded resilient expansion joint against all vertical walls with flashing to within one (1) inch of finished grade. Pour steep asphalt or equal over premoulded expansion joint to within 1/4" from the top of paver. No expansion joint of any kind is required against curbs.



ACME BRICK

HEAVY VEHICULAR TRAFFIC PAVER





Sasaki Associates, Inc. M e m o r a n d u m

Date 1/18/96

Project Addison Circle SA# 51443.00

Subject Pedestrian Area Brick

From Nancy Fleming Armstrong

To John Baumgartner
cc: D. Kenney, A. Fujimori, J. Maloney

As per your request, we have reviewed the specifications and test report from Professional Service Industries, Inc. dated November 14, 1995 for the Old Virginia brick that is proposed for the pedestrian sidewalks. Our reference for this review was *ASTM C 902 - 92 Standard Specification for Pedestrian and Light Traffic Paving Brick* (copy attached). We have the following comments:

1. Class SX Type II brick is adequate for pedestrian sidewalks.
2. ASTM C 902 specifies that Class SX brick must have an average compressive strength of 8,000 psi for 5 brick and an individual compressive strength of 7,000 psi. The test report indicates that the average for the Old Virginia brick is 6,664 psi and only 1 of the 5 bricks is equal or above 7,000 psi. This indicates a soft brick that may crack and crumble with time.
3. ASTM C 902 specifies that Class SX brick must have a cold water absorption percentage average of 8.0 maximum. The test report indicates that the average for the Old Virginia brick is 7.80 percent. While this is within the range, it is very near the maximum.

Therefore, because the Old Virginia brick does not meet the ASTM compressive strength requirements and because it is at the high end of the absorption range, we recommend that an alternative brick be selected.

In addition, this brick is not adequate for areas that will receive vehicular traffic. While it is not indicated on the plans to be proposed in vehicular areas, it does occur in two locations that could get "stray" auto activity; along edges of the Mews, and on the corner radii where flush curbs will occur. We recommend that either a vehicular brick be used in these locations, or alternative methods of auto control be implemented.

Also, the plans indicate areas where a vehicular crossing of the sidewalk will occur and a vehicular brick is identified for those locations. We have concerns about the visual impact of this, since the pedestrian and auto bricks are from different sources. We recommend that close design attention be given to how these areas are integrated into the sidewalk.

1925 San Jacinto Street
Dallas, Texas
75201

Telephone 214 922 9380
Facsimile 214 954 0687

Designation: C 902 – 92

Standard Specification for Pedestrian and Light Traffic Paving Brick[1]

This standard is issued under the fixed designation C 902; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers brick intended for use as paving material to support pedestrian and light vehicular traffic. The units are designed for use in such places as patios, walkways, floors, plazas, and driveways. The units are not intended to support heavy vehicular traffic or for applications covered by Specification C 410.

1.2 The property requirements of this standard apply at the time of purchase. The use of results from testing of brick extracted from masonry structures for determining conformance or non-conformance to the property requirements (Section 4) of this standard is beyond the scope of this standard.

1.3 Brick are manufactured from clay, shale, or similar naturally occurring earthy substances and subjected to a heat treatment at elevated temperatures (firing). The heat treatment must develop sufficient fired bond between the particulate constituents to provide the strength and durability requirement of this specification (see firing, fired bond and incipient fusion in Terminology C 43).

1.4 The brick are available in a variety of sizes, colors, and shapes. They are available in three classes according to exposure environment and three types according to type of traffic exposure.

1.5 The values stated in inch-pound units are to be regarded as the standard.

2. Referenced Documents

2.1 *ASTM Standards:*

C 43 Terminology of Structural Clay Products[2]

C 67 Test Methods of Sampling and Testing Brick and Structural Clay Tile[2]

C 88 Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate[3]

C 410 Specification for Industrial Floor Brick[2]

C 418 Test Method for Abrasion Resistance of Concrete by Sandblasting[3]

3. Classification

3.1 Light traffic paving brick are classified according to the severity of their use-environment. Two types of environment are considered: (*1*) weather and (*2*) traffic:

3.1.1 *Weather:*

3.1.1.1 *Class SX*—Brick intended for use where the brick may be frozen while saturated with water.

3.1.1.2 *Class MX*—Brick intended for exterior use where resistance to freezing is not a factor.

3.1.1.3 *Class NX*—Brick not intended for exterior use but which may be acceptable for interior use where protected from freezing when wet.

NOTE 1—A surface coating may be applied to any class of brick of this standard when protected from freezing while wet. The function of the coating is to prevent penetration of dirt or liquids into the pores of the brick. Coatings should be applied only after complete drying of the paving.

3.1.2 *Traffic:*

3.1.2.1 *Type I*—Brick exposed to extensive abrasion, such as in driveways and entranceways to public or commercial buildings.

3.1.2.2 *Type II*—Brick exposed to intermediate traffic, such as floors in restaurants or stores and exterior walkways.

3.1.2.3 *Type III*—Brick exposed to low traffic, such as floors or patios in single-family homes.

4. Physical Requirements

4.1 *Durability*—The brick shall conform to the physical requirements for the class specified as prescribed in Table 1.

4.2 *Performance Alternate*—If information on the performance of the units in a similar application of similar exposure and traffic is furnished by the manufacturer or his agent and is found acceptable by the specifier of the pavement material, or his agent, the physical requirements in 4.1 may be waived.

4.3 *Absorption Alternate*—If the average water absorption is less than 6 % after 24-h submersion in room-temperature water, the requirement for saturation coefficient shall be waived.

4.4 *Freezing and Thawing Test Alternate*—The requirements for water absorption (24 h cold) and saturation coefficient specified in 4.1 shall be waived provided a sample of five brick, meeting all other requirements, passes the freezing and thawing test as described in the Rating section of the Freezing and Thawing procedures of Test Methods C 67.

4.4.1 No breakage and not greater than 0.5 % loss in dry weight of any individual unit.

NOTE 2—The 50 cycle freezing and thawing test is specified only as an alternative when brick do not conform to either Table 1 requirements for maximum water absorption and saturation coefficient, or to the restrictive absorption requirements in 4.3.

4.5 *Sulfate Soundness Test Alternate*—The requirements specified in 4.1 shall be waived if a sample of five brick survives 15 cycles of the sulfate soundness test in accordance

[1] This specification is under the jurisdiction of ASTM Committee C-15 on Manufactured Masonry Units, and is the direct responsibility of Subcommittee C15.02 on Clay Brick and Structural Clay Tile.

Current edition approved Sept. 15, 1992. Published November 1992. Originally published as C 902 – 79. Last previous edition C 902 – 91a.

[2] *Annual Book of ASTM Standards*, Vol 04.05.

[3] *Annual Book of ASTM Standards*, Vol 04.02.

TABLE 1 Physical Requirements[A]

Designation	Compressive Strength, flatwise, gross area, min, psi (MPa)		Cold Water Absorption, max, %		Saturation Coefficient, max[B]	
	Average of 5 Brick	Individual	Average of 5 Brick	Individual	Average of 5 Brick	Individual
Class SX	8000 (55.2)	7000 (48.3)	8	11	0.78	0.80
Class MX	3000 (20.7)	2500 (17.2)	14	17	no limit	no limit
Class NX	3000 (20.7)	2500 (17.2)	no limit	no limit	no limit	no limit

[A] Minimum modulus of rupture values should be considered by the purchaser for uses of brick where support or loading may be severe.
[B] The saturation coefficient is the ratio of absorption by 24-h submersion in room temperature water to that after 5-h submersion in boiling water.

TABLE 2 Abrasion Requirements[A]

	(1) Abrasion Index,[B] max	(2) Volume Abrasion Loss,[C] max, cm^3/cm^2
Type I	0.11	1.7
Type II	0.25	2.7
Type III	0.50	4.0

[A] Select the sample according to the sampling procedure of Test Methods C 67. The brick shall meet the requirements of either column (1) or (2). The values listed shall not be exceeded by any individual unit within the sample.

[B] The abrasion index is calculated from the cold absorption in percent and the compressive strength in pounds per square inch as follows:

$$\text{Abrasion index} = \frac{100 \times \text{absorption}}{\text{compressive strength}}$$

Compressive strength values are influenced by specimen shape (particularly the height to width ratio of the test specimen). Therefore, a shape is specified which conforms to the data on which the abrasion index is based.[4]

The compressive strength shall be determined on specimens measuring 3⅝ by 3⅝ by 2¼ in. ± ⅛ in. (98 by 98 by 57 mm ± 6 mm) for length, width, and height respectively. The brick shall be without core holes, other perforations or frogs. Other shaped specimens may be used provided that the producer submits evidence acceptable to the purchaser that the change in shape gives equivalent strength results to those of the specified shape.

The abrasion resistance should be determined according to Note 2 in those cases where the procedural requirements for compressive strength cannot be met.

[C] The volume abrasion loss shall be determined in accordance with Test Method C 418, with the following changes in procedure:

(1) The sand shall be a natural silica sand from Ottawa, IL, graded to pass a No. 50 (300-μm) sieve and retained on a No. 100 (150-μm) sieve.

(2) The test shall be run on dry brick.

(3) The duration of the test shall be 2 min.

(4) The rate of sand flow shall be 400 g/min.

(5) The volume loss shall be determined by filling the abraded depression with modeling clay, striking off level with the original surface of the brick, and removing and weighing the modeling clay. The volume loss shall be calculated from the bulk density of the modeling clay. The bulk density shall be determined on each lot of modeling clay.

An alternative method of determining the weight of clay used in filling the sand-blast cavity is to determine the weight of the modeling clay sample before and after filling the cavity.

with Sections 4, 5, and 8 of Test Method C 88 with no visible damage.

NOTE 3—The sulfate soundness test is an optional substitute test for the freezing-and-thawing test (4.4).

4.6 *Abrasion Resistance*—The brick shall meet the requirements of either column (1) or (2) of Table 2 for the applicable traffic use (see 3.1.2).

4.7 *Warpage*—The concave or convex warpage of any face intended to be the exposed surface or edge of the paving shall not exceed 1/16 in. (1.6 mm) for each 6 in. (150 mm) of brick length when measured in accordance with Test Methods C 67.

4.8 *Molded Brick (Soft Mud, Semi-Dry Pressed, and Dry Pressed Brick)*—The requirements listed in Table 1 shall be changed for molded brick to permit maximum absorption of 16 % average and 18 % individual, and minimum compressive strengths of 4000 psi (27.6 MPa) average and 3500 psi (24.1 MPa) individual for Class SX, provided that the requirements for saturation coefficient of Table 1 are met.

4.9 Unless otherwise specified by the purchaser, brick of Classes SX and MX shall be accepted instead of Class NX, and Class SX shall be accepted instead of Class MX. Surface coatings will not be required of Classes SX and MX when used instead of Class NX. Types I and II shall be accepted instead of Type III, and Type I shall be accepted instead of Type II.

NOTE 4—Skid/slip resistance should be considered by the purchaser for uses of brick where pedestrian traffic is anticipated. Methods of testing this characteristic are under study and it is hoped that a specification for this property can be added in future revisions of this standard when suitable test methods are developed.

5. Efflorescence

5.1 When paving brick are tested in accordance with Test Methods C 67, the rating for efflorescence shall be: "not effloresced."

6. Size

6.1 The size of the brick shall be as specified by the purchaser or produced by the manufacturer as a stock item.

6.2 The tolerance on dimension shall depend on the bond pattern and method of installation of the units. Three different methods of applications are covered:

TABLE 3 Maximum Permissible Extent of Chippage from Edges and Corners

NOTE—The aggregate length of chips on a single unit shall not exceed 10 % of the perimeter of the exposed face of the brick.

Application	Chippage in Inches (Millimetres) in from	
	Edge	Corner
PS	3/16 (7.9)	½ (12.7)
PX	¼ (6.4)	⅜ (9.5)
PA	as specified by purchaser	

TABLE 4 Tolerances on Dimensions

Dimension, in. (mm)	Maximum Permissible Variation from Specified Dimension, plus or minus in. (mm)		
	Application PS	Application PX	Application PA
3 (76) and under	⅛ (3.2)	1/16 (1.6)	no limit
Over 3 to 4 (76 to 102) incl	3/16 (4.7)	3/32 (2.4)	no limit
Over 5 to 8 (127 to 203) incl	¼ (6.4)	⅛ (3.2)	no limit

[4] McBurney, J. W., Brink, R. H., Eberle, A. R., "Relation of Water Absorption and Strength of Brick to Abrasive Resistance," *Proceedings, ASTM*, Vol 40, 1940, pp. 1143–1151.

5.2.1 *Application PS*—Floor and patio brick intended for ...rd use and installed with a mortar joint between ...ial units, or in an installation without mortar joints ...ween units when they are laid in running or other bonds ...requiring extremely close dimensional tolerances.

5.2.2 *Application PX*—Floor and patio brick intended for ...tallation without mortar joints between the units, where ...ceptionally close dimensional tolerances are required as a ...ult of special bond patterns or unusual construction ...uirements.

5.2.3 *Application PA*—Floor and patio units manufac...ed and selected to produce characteristic architectural ...ects resulting from nonuniformity in size, color, and ...ture of individual units. (The textures may exhibit inclu...n of nonuniform nodules of mineral substances or pur...sely introduced cracks that enhance the appearance of the units.) The requirements on warpage as specified in 4.7 do not apply to this application.

6.3 When the application is not specified, the require...ments for Application PS shall govern.

7. Visual Inspection

7.1 The brick shall be free of cracks or other imperfections detracting from the appearance of a designated sample when viewed from a distance of 15 ft (4.6 m) for Application PX and a distance of 20 ft (6 m) for Application PS.

7.2 The parts of the brick that will be exposed in place shall be free of chips that exceed the limits given in Table 3.

7.3 Unless otherwise agreed upon by the purchaser and the seller, a delivery of brick shall contain not more than 5 % brick that do not meet the combined requirements of Tables 2, 3, and 4, and including broken brick.

EXPLANATORY NOTE

Durability—The resistance of brick to weathering cannot be pre...ted with complete assurance at the present state of knowledge. There ...no known test that can predict weathering resistance with complete ...curacy.

Brick in general is superior in weathering resistance to other building ...aterials. There are innumerable instances of satisfactory performance ...yond 200 years and even into the thousands of years. Nevertheless, ...re are some brick that cannot survive a few winters of a severe ...ezing and thawing environment.

The durability requirements of the specification attempt to exclude such brick. This specification utilizes the best knowledge available at this time and is based on extensive research by several investigators. The durability requirements have an excellent correlation with in-use performance. Nevertheless, it is known that some brick that meet this specification may not be serviceable in severe climates. Furthermore, other brick that do not meet these specifications may show superior serviceability in the most severe climate. The best indication of brick durability is its service experience record.

Hulit-Zollars, Inc. / Engineering / Architecture / 3131 McKinney Avenue / Suite 600 / LB 105 / Dallas, Texas 75204-2416 / 214-871-3311 / FAX 214-871-0757

January 18, 1996

Ms. Carmen Moran
Director of Development Services
Town of Addison
P.O. Box 144
5300 Belt Line Road
Addison, Texas 75001

RE: Final Plat/Addison Circle Phase I
HZI Project No. 01-1932-01

Dear Ms. Moran:

I have received the staff report dated January 18, 1996 which recommends that the referenced plat be tabled pending resolution of the three items on Mr. John Baumgartner's memo to you of the same date. Those items are noted below, followed by our response and/or proposed action.

1. *The geometrics for the roundabout at Mildred and Quorum are subject to the final design. This may necessitate an enlargement of the right-of-way provided.*

   Given the criteria for the design of the modern roundabout which were imposed on us by the Town of Addison (e.g., the traffic volumes to be expected on Mildred and Quorum), there are no circumstances under which additional right-of-way will be needed for the roundabout (A separate response covering all roundabout issues is forthcoming).

2. *Add the following note to sheet one:*

   The use of the "private utility easements" shown on this plat are subject to the terms and conditions set forth in the street license/rental agreement between the Town of Addison recorded in DCDR Vol. _____ Pg. _____.

   This note will be been added to the plat as requested, however, my draft of that document does not refer to it as a "street license/rental agreement".

3. *Verify that the easements necessary for franchised and licensed utilities (Southwestern Bell, TU Electric, Lone Star Gas, Herron Cable, TCI Cable, etc.) are provided.*

   To date we have contacted every utility provider at least twice and asked them to identify for us what they will require (see attached letters). We have had no meaningful responses from any of the possible service providers except T.U. Electric. However, the following summarizes our understanding of their probable needs.

TCI & Herron Cable:

There will be no need for these facilities in Columbus's projects and therefore no need for easements in Phase I.

Southwestern Bell Telephone:

Telephone trunk lines will run in the public right-of-way as needed throughout the district. Columbus's project will have a private telephone system which will be fed by SWBT to a single point in Building A. Equipment will be inside the building, therefore, no easements should be required.

Lone Star Gas:

Gas mains will be run in the public right-of-way as needed throughout the district to provide for service to various facilities. Phase I currently indicates a single gas meter near the northeast corner of Building A. Normally Lone Star Gas does not require easements for individual service lines of this length. If one proves to be necessary, it can be documented by separate instrument.

T.U. Electric

The easements requested by T.U.E. are shown on the plat. Pending the outcome of final electrical design for street lighting, additional easement area may be needed for additional transformers. These can be handled by separate instrument or an amended plat (replat).

I have asked on several occasions what constitutes a "sign-off" by the public utilities. I cannot obtain it until I know what is expected. It is my belief that these three items can be adequately dealt with prior to the Planning and Zoning Commission meeting of January 25th, however, I will confirm the status of the plat prior to the meeting.

Sincerely,

HUITT-ZOLLARS, INC.
Engineering/Architecture

Andrew C. Oakley, P.E.
Senior Vice President

ACO/psp

cc: John Baumgartner
Bryant Nail

G:\PRO\N01193201\CM0118.LTR

HUITT-ZOLLARS

Huitt-Zollars, Inc. / Engineering / Architecture / 3131 McKinney Avenue / Suite 600 / LB 105 / Dallas, Texas 75204-2416 / 214-871-3311 / FAX 214-871-0757

November 16, 1995

Ms. Jeanne Hooker
Lone Star Gas
2095 N. Collins, Suite 101
Richardson, Texas 75080

Re: Addison Circle
Quorum Drive and Mildred Street
Town of Addison
Huitt-Zollars Project No. 01-1822-04

Dear Ms. Hooker:

The Town of Addison has hired Huitt-Zollars, Inc. for the engineering design of the public infrastructure for Addison Circle (formerly the Addison Urban Center), a multi-family residential and retail development located near the intersection of Quorum Drive and Mildred Street. Enclosed please find Mapsco 4Y and conceptual drawings showing preliminary layouts of drainage, water and wastewater lines.

Please review the proposed development with respect to your facilities and indicate where the existing lines are located and where any proposed facilities may be desired. This project is scheduled for construction to commence in January 1996 making coordination with your facilities critical at this time. Upon request we can send you 20 scale drawings of the Phase I development to assist you in locating your facilities. We would be happy to meet and address your needs in person if necessary.

Thank you for your help in this matter and please feel free to call if you have any questions.

Sincerely,

HUITT-ZOLLARS, INC.

David Meyers

David Meyers

Attachment: Conceptual Plans
Mapsco 4Y

HUITT-ZOLLARS

Huitt-Zollars, Inc. / Engineering / Architecture / 3131 McKinney Avenue / Suite 600 / LB 105 / Dallas, Texas 75204-2416 / 214-871-3311 / FAX 214-871-0757

November 16, 1995

Mr. Berry Billington
MCI
2250 Lakside Blvd.
Richardson, Texas 75082

Re: Addison Circle
Quorum Drive and Mildred Street
Town of Addison
Huitt-Zollars Project No. 01-1822-04

Dear Mr. Billington:

The Town of Addison has hired Huitt-Zollars, Inc. for the engineering design of the public infrastructure for Addison Circle (formerly the Addison Urban Center), a multi-family residential and retail development located near the intersection of Quorum Drive and Mildred Street. Enclosed please find Mapsco 4Y and conceptual drawings showing preliminary layouts of drainage, water and wastewater lines.

Please review the proposed development with respect to your facilities and indicate where the existing lines are located and where any proposed facilities may be desired. This project is scheduled for construction to commence in January 1996 making coordination with your facilities critical at this time. Upon request we can send you 20 scale drawings of the Phase I development to assist you in locating your facilities. We would be happy to meet and address your needs in person if necessary.

Thank you for your help in this matter and please feel free to call if you have any questions.

Sincerely,

HUITT-ZOLLARS, INC.

David Meyers

David Meyers

Attachment: Conceptual Plans
Mapsco 4Y

HUITT-ZOLLARS

Huitt-Zollars, Inc. / Engineering / Architecture / 3131 McKinney Avenue / Suite 600 / LB 105 / Dallas, Texas 75204-2416 / 214-871-3311 / FAX 214-871-0757

November 16, 1995

Mr. Dan Shipp
Southwestern Bell Telephone
275 N. Greenville Ave.
Richardson, Texas 75081

Re: Addison Circle
Quorum Drive and Mildred Street
Town of Addison
Huitt-Zollars Project No. 01-1822-04

Dear Mr. Shipp:

The Town of Addison has hired Huitt-Zollars, Inc. for the engineering design of the public infrastructure for Addison Circle (formerly the Addison Urban Center), a multi-family residential and retail development located near the intersection of Quorum Drive and Mildred Street. Enclosed please find Mapsco 4Y and conceptual drawings showing preliminary layouts of drainage, water and wastewater lines.

Please review the proposed development with respect to your facilities and indicate where the existing lines are located and where any proposed facilities may be desired. This project is scheduled for construction to commence in January 1996 making coordination with your facilities critical at this time. Upon request we can send you 20 scale drawings of the Phase I development to assist you in locating your facilities. We would be happy to meet and address your needs in person if necessary.

Thank you for your help in this matter and please feel free to call if you have any questions.

Sincerely,

HUITT-ZOLLARS, INC.

David Meyers

Attachment: Conceptual Plans
Mapsco 4Y

HUITT-ZOLLARS

Huitt-Zollars, Inc. / Engineering / Architecture / 3131 McKinney Avenue / Suite 600 / LB 105 / Dallas, Texas 75204-2416 / 214-871-3311 / FAX 214-871-0757

November 16, 1995

Mr. George Womack
TCI Cablevision & TCG Fiber Optics
934 E. Centerville Road
Garland, Texas 75041

Re: Addison Circle
Quorum Drive and Mildred Street
Town of Addison
Huitt-Zollars Project No. 01-1822-04

Dear Mr. Womack:

The Town of Addison has hired Huitt-Zollars, Inc. for the engineering design of the public infrastructure for Addison Circle (formerly the Addison Urban Center), a multi-family residential and retail development located near the intersection of Quorum Drive and Mildred Street. Enclosed please find Mapsco 4Y and conceptual drawings showing preliminary layouts of drainage, water and wastewater lines.

Please review the proposed development with respect to your facilities and indicate where the existing lines are located and where any proposed facilities may be desired. This project is scheduled for construction to commence in January 1996 making coordination with your facilities critical at this time. Upon request we can send you 20 scale drawings of the Phase I development to assist you in locating your facilities. We would be happy to meet and address your needs in person if necessary.

Thank you for your help in this matter and please feel free to call if you have any questions.

Sincerely,

HUITT-ZOLLARS, INC.

David Meyers

Attachment: Conceptual Plans
Mapsco 4Y

HUITT-ZOLLARS

Huitt-Zollars, Inc. / Engineering / Architecture / 3131 McKinney Avenue / Suite 600 / LB 105 / Dallas, Texas 75204-2416 / 214-871-3311 / FAX 214-871-0757

November 16, 1995

Mr. Dennis Anderson
Herron Cablevision
5227 FM 813
Waxahachie, Texas 75165

Re: Addison Circle
Quorum Drive and Mildred Street
Town of Addison
Huitt-Zollars Project No. 01-1822-04

Dear Mr. Anderson:

The Town of Addison has hired Huitt-Zollars, Inc. for the engineering design of the public infrastructure for Addison Circle (formerly the Addison Urban Center), a multi-family residential and retail development located near the intersection of Quorum Drive and Mildred Street. Enclosed please find Mapsco 4Y and conceptual drawings showing preliminary layouts of drainage, water and wastewater lines.

Please review the proposed development with respect to your facilities and indicate where the existing lines are located and where any proposed facilities may be desired. This project is scheduled for construction to commence in January 1996 making coordination with your facilities critical at this time. Upon request we can send you 20 scale drawings of the Phase I development to assist you in locating your facilities. We would be happy to meet and address your needs in person if necessary.

Thank you for your help in this matter and please feel free to call if you have any questions.

Sincerely,

HUITT-ZOLLARS, INC.

David Meyers

David Meyers

Attachment: Conceptual Plans
Mapsco 4Y

MCI metro
2250 Lakeside Blvd.
Richardson, TX 75082
214 918 1938

September 11, 1995

RECEIVED

SEP 15 1995

Huitt-Zollars, Inc.
3131 McKinney Avenue
Suite 600, LB 105
Dallas, TX 75204-2416

ATTN: David Meyers

RE: Addison Urban Center, Quorem Dr., Project 01-1822-04
MCIM ID NUMBER: 23087-95

Dear David Meyers:

MCI Metro, Inc., formerly known as ATS-Western Union has received your letter regarding the above referenced project. Our records indicate that MCI Metro does not maintain any facilities in this area and will not be involved with this project as defined by your letter.

If you have any questions regarding MCI Metro underground plant records or require additional information, please contact me at (214) 918-1977.

Sincerely,

Michael L. Warner
MCI Metro Documentation Division

cc: file

Sprint

2511 E. Grauwyler Road
Irving, TX 75061

Fiber Operations

October 18, 1995

Mr. David Meyers
Huitt-Zollars, Inc.
3131 McKinney Avenue
Suite 600
Dallas, TX 75204-2416

Re: Addison Urban Center
Quorum Drive and Mildred Street
Town of Addison
Huitt-Zollars Project No. 01-1822-04

Dear Mr. Meyers:

After reviewing your plans for the above proposed project it appears that there is NO CONFLICT with our facilities.

Please have your crews notify there local ONE CALL AGENCY when construction starts. If there is an emergency call our Call Before You Dig center at 1-800-521-0579.

If I can be of further assistance please call me at (214)506-1953 and thank you for notifying us of this project in advance.

Sincerely,

James B. Stuart
Cable Project Engineer
North Texas Division

File 01182204

EXPLORER PIPELINE COMPANY

RECEIVED
AUG3 0 1995
Huitt-Zollars

August 25, 1995

Mr. David Meyers
Huitt-Zollars
3131 Mckinney Avenue
Suite 600 LB 105
Dallas, Texas 75204-2416

Re: Construction of Addison Urban Center, Dallas County, Texas; Explorer Pipeline MP 37.8 Greenville to Carrollton Jct. 12" line, Alignment Drawing 231-AA-1010.

Dear Mr. Meyers:

Based on review of the preliminary plans of the referenced project, sent with your August 23, 1995 letter, Explorer Pipeline Company finds no conflicts between its 12-inch, high-pressure petroleum products pipeline and the proposed project.

Explorer's 12 inch pipeline lies approximately eight (8) feet inside the D.A.R.T. right-of-way. Should your plans change to include any location in the vicinity of Explorer's Pipeline, your contact for pipeline locating, flagging, and depth probing when necessary is:

Mr. Richard Allen
Greenville Area Supervisor
Rt. 1, Box 354
Caddo Mills, TX 75135
(903) 527-3151

Also, please include the following warning on all construction prints that involve Explorer's Pipeline.

"WARNING!!! Explorer's 12 Inch High Pressure Petroleum Products Pipeline. Contact Richard Allen 48 Hours Prior To Any Construction Near Pipeline."

Sasaki Associates, Inc. M e m o r a n d u m

Date 1/18/96

Project Addison Circle SA# 51443.00

Subject Pedestrian Area Brick

From Nancy Fleming Armstrong

To John Baumgartner
cc: D. Kenney, A. Fujimori, J. Maloney

As per your request, we have reviewed the specifications and test report from Professional Service Industries, Inc. dated November 14, 1995 for the Old Virginia brick that is proposed for the pedestrian sidewalks. Our reference for this review was *ASTM C 902 - 92 Standard Specification for Pedestrian and Light Traffic Paving Brick* (copy attached). We have the following comments:

1. Class SX Type II brick is adequate for pedestrian sidewalks.
2. ASTM C 902 specifies that Class SX brick must have an average compressive strength of 8,000 psi for 5 brick and an individual compressive strength of 7,000 psi. The test report indicates that the average for the Old Virginia brick is 6,664 psi and only 1 of the 5 bricks is equal or above 7,000 psi. This indicates a soft brick that may crack and crumble with time.
3. ASTM C 902 specifies that Class SX brick must have a cold water absorption percentage average of 8.0 maximum. The test report indicates that the average for the Old Virginia brick is 7.80 percent. While this is within the range, it is very near the maximum.

Therefore, because the Old Virginia brick does not meet the ASTM compressive strength requirements and because it is at the high end of the absorption range, we recommend that an alternative brick be selected.

In addition, this brick is not adequate for areas that will receive vehicular traffic. While it is not indicated on the plans to be proposed in vehicular areas, it does occur in two locations that could get "stray" auto activity; along edges of the Mews, and on the corner radii where flush curbs will occur. We recommend that either a vehicular brick be used in these locations, or alternative methods of auto control be implemented.

Also, the plans indicate areas where a vehicular crossing of the sidewalk will occur and a vehicular brick is identified for those locations. We have concerns about the visual impact of this, since the pedestrian and auto bricks are from different sources. We recommend that close design attention be given to how these areas are integrated into the sidewalk.

1925 San Jacinto Street
Dallas, Texas
75201

Telephone 214 922 9380
Facsimile 214 954 0687

Sasaki Associates, Inc. Facsimile Transmittal

Planning
Architecture
Landscape Architecture
Urban Design
Transportation Planning
Civil Engineering
Environmental Services
Interior Design
Graphic Design

7/18/96
Date

Addison Circle Road Point SA #61546.00
Project name/number

Carmen Moran cc: AF
To

Town of Addison
Company

960.7684
Facsimile number Voice number

Nancy Fleming Armstrong
From

1 9:35 AM
Number of pages transmitted (including transmittal) Time

Transmitted by Extension

As per your request, we have reviewed the revised paving plan prepared by Hunt-Zollars showing the modified paving pattern. We are in concurrance with the proposal.

John,
OK to go

1925 San Jacinto Street
Dallas, Texas
75201

Telephone 214 922 9380
Facsimile 214 954 0687

STREET/SIDEWALK BRICK COMPARISON

	Shillington 2-1/4" Modular Paver	Serendipity 2-1/4" Modular Paver	Yorkshire 2-1/4" Modular Paver	Type I, Class SX ASTM C902
Compressive Strength				
Min. Individual	4,710 psi	7,150 psi	7,260 psi	3,500 psi *
Avg. of 5 Brick	6,090 psi	7,510 psi	8,530 psi	4,000 psi *
Modulus of Rupture				
Min. Individual	Not Given	Not Given	Not Given	Not Specified
Avg. of 5 Brick	Not Given	Not Given	Not Given	Not Specified
Cold Water Absorption				
Max. Individual	2.5%	3.0%	4.9%	18% *
Max. Avg. of 5 Brick	2.1%	2.3%	3.8%	16% *
Saturation Coefficient				
Max. Individual	0.49	0.55	0.59	0.80
Max. Avg. of 5 Brick	0.45	0.49	0.54	0.78
Abrasion Index				
Max. Individual	0.051	0.046	0.067	0.11
5 Hr. Boil Absorption				
Max. Individual	5.1%	5.5%	8.4%	13.75% Calculated
Max. Avg. of 5 Brick	4.5%	4.8%	7.1%	10.25% Calculated

* Refer to Section 4.7 of C 902-93 ASTM Standards. (Molded Brick Requirements)

STREET BRICK COMPARISON CONTINUED

Basis for calculated Values in the above table:

Sat Coeff. = 24 Hour Cold Water Absorption/5 Hour Boil Absorption

Abrasion Index = (100 X Absorption)/Compressive Strength

SIDEWALK BRICK COMPARISON (EXTRUDED BRICK)

	Type I, Class SX ASTM C902	Acme Sidewalk Paver
Compressive Strength		
Min. Individual	7,000 psi	7,928 psi
Avg. of 5 Brick	8,000 psi	10,429 psi
Modulus of Rupture		
Min. Individual	Not Specified	Not Given
Avg. of 5 Brick	Not Specified	Not Given
Cold Water Absorption		
Max. Individual	11%	6.3%
Max. Avg. of 5 Brick	8%	5.3%
Saturation Coefficient		
Max. Individual	0.80	0.81
Max. Avg. of 5 Brick	0.78	0.78
Abrasion Index		
Max. Individual	0.11	0.047 Calculated
5 Hr. Boil Absorption		
Max. Individual	13.75% Calculated	7.8%
Max. Avg. of 5 Brick	10.25% Calculated	6.8%

STREET BRICK COMPARISON CONTINUED

Basis for calculated Values in the above table:

Sat Coeff. = 24 Hour Cold Water Absorption/5 Hour Boil Absorption

Abrasion Index = (100 X Absorption)/Compressive Strength

Sasaki Associates, Inc. M e m o r a n d u m

Date 4/26/96

Project Addison Circle SA# 51443.00

Subject Brick for Paving

From Nancy Fleming Armstrong

To John Baumgartner
cc: DK, AF, JM

We received test reports from McCreath Laboratories for the three colors of Glen-Gery Corporation bricks: Shillington, Yorkshire, and Serendipity.

1. All three colors are identified as molded pavers. Each comply with the modified ASTM C902-92 SX Type I requirements for molded brick.

2. As per your request, we have compared these modified standards with the Acme brick, which complies with the ASTM C902-92 SX Type I requirements. Two of the three molded brick have compressive strengths less than required by the ASTM requirement, and all of them are substantially less than the compressive strength of the Acme brick. The saturation coefficients are within the required range and slightly lower than the Acme brick. The cold water absorption rates are slightly higher, but within the required range. As a result, the Acme brick appears to be a stronger and more durable paver.

3 ASTM C902-92 specification Section 1.1 states that "This specification covers brick intended for use as paving material to support pedestrian and light vehicular traffic....The units are not intended to support heavy vehicular traffic..." These molded bricks are not adequate for use as a street paver.

   In addition, the Glen-Gery bricks do not comply with item A. Page PF-3 of "Addendum No. 1 To The Construction Specifications and Contract Documents" dated January 17, 1996 prepared by Huitt-Zollars which outlines the vehicular brick requirements.

The Glen-Gery molded bricks are a very high quality molded brick. However, they do not comply with ASTM C902-92 *Standard Specification for Pedestrian and Light Traffic Paving Brick*, SX Type I requirements, which are more restrictive.

As stated previously, we recommend that the long term durability should be evaluated on proven performance of the bricks in comparable applications and that the Town of Addison should be in agreement with that long term performance.

1225 San Jacinto Street
Dallas, Texas
75201

Telephone 214 922 9380
Facsimile 214 954 0687

STREET BRICK COMPARISON

	Shillington 2-1/4" Modular Paver	Serendipity 2-1/4" Modular Paver	Yorkshire 2-1/4" Modular Paver	Type I, Class SX ASTM C902	Acme Sidewalk Paver
Compressive Strength					
Min. Individual	4,710 psi	7,150 psi	7,260 psi	3,500 psi *	7,928 psi
Avg. of 5 Brick	6,090 psi	7,510 psi	8,530 psi	4,000 psi *	10,429 psi
Modulus of Rupture					
Min. Individual	Not Given	Not Given	Not Given	Not Specified	Not Given
Avg. of 5 Brick	Not Given	Not Given	Not Given	Not Specified	Not Given
Cold Water Absorption					
Max. Individual	2.5%	3.0%	4.9%	18% *	6.3%
Max. Avg. of 5 Brick	2.1%	2.3%	3.8%	16% *	5.3%
Saturation Coefficient					
Max. Individual	0.49	0.55	0.59	0.80	0.81
Max. Avg. of 5 Brick	0.45	0.49	0.54	0.78	0.78
Abrasion Index					
Max. Individual	0.051	0.046	0.067	0.11	0.047 Calculated
5 Hr. Boil Absorption					
Max. Individual	5.1%	5.5%	8.4%	13.75% Calculated	7.8%
Max. Avg. of 5 Brick	4.5%	4.8%	7.1%	10.25% Calculated	6.8%

* Refer to Section 4.7 of C 902-93 ASTM Standards.

STREET BRICK COMPARISON CONTINUED

Basis for calculated Values in the above table:

Sat Coeff. = 24 Hour Cold Water Absorption/5 Hour Boil Absorption

Abrasion Index = (100 X Absorption)/Compressive Strength

Glen-Gery Corporation
Technical Services/Research
Route 61
P.O. Box 340
Shoemakersville, PA 19555
610/562-3076
Fax: 610/562-2084

22 July 1996

Public Works Director
P. O. Box 144
Addison, Texas 75001

ATTN: John Baumgartner

REFERENCE: Addison Circle
Dealer/Distributor: Metro Brick

Dear Mr. Baumgartner,

As requested by our Midwest Regional Sales Office, please find enclosed letters of certification and test reports for the following modular paver size units as manufactured by the Iberia Plant of the Glen-Gery Corporation.

Serendipity Modular Paver Solid (2-1/4" X 3-5/8" X 7-5/8") (Lot Number: 064061)
Shillington Modular Paver Solid (2-1/4" X 3-5/8" X 7-5/8") (Lot Number: 11260D)
Yorkshire Modular Paver Solid (2-1/4" X 3-5/8" X 7-5/8") (Lot Number: 03513D)

Should you require any additional information, please contact the Midwest Regional Sales Office. Thank you for your interest in Glen-Gery's line of fine quality products.

Truly yours,

George Robinson.

George Robinson
Director of Technical Services

gr:jy

Enclosures

cc: Midwest Regional Sales Office
Iberia Plant

Glen-Gery Corporation
Technical Services/Research
Route 61
P.O. Box 340
Shoemakersville, PA 19555
610/562-3076
Fax: 610/562-2084

22 July 1996

Public Works Director
P. O. Box 144
Addison, Texas 75001

ATTN: John Baumgartner

REFERENCE: Addison Circle
Dealer/Distributor: Metro Brick

Dear Mr. Baumgartner,

The Serendipity Modular Paver Solid (2-1/4" X 3-5/8" X 7-5/8") (Lot Number: 064061) size units as manufactured by the Iberia Plant of the Glen-Gery Corporation meet ASTM Designation: C902-95, the Standard Specification for Pedestrian and Light Traffic Paving Brick, Class SX, Type I, Application PS.

Truly yours,

George Robinson.

George Robinson
Director of Technical Services

gr:jy

cc: Midwest Regional Sales Office
Iberia Plant

610 WILLOW STREET
HARRISBURG, PENNSYLVANIA 17101
PHONE 238-9331

RECEIVED
JUN 27 1994

Laboratory Test No. *IB-396* Date *June 24, 1994*

To *GLEN-GERY CORPORATION*

Brick Identification *SERENDIPITY PAVER 7 5/8 X 3 5/8 X 2 1/4 MOLDED 06406I 6-3-94*

The following is a report of Tests on Building Brick conducted in accordance with ASTM Designation C67-93a "Standard Method of Sampling and Testing Brick"

Sample Received *6-15-94* (Date) From *IBERIA* (Plant) Test Completed *June 24, 1994* (Date)

Unit Identification	Compressive Strength (Gross Area/Flatwise)	ABSORPTION			SUCTION RATE	EFFLORESCENCE
		5 Hour Submersion in Boiling Water	24 Hour Submersion in Cold Water	Maximum Saturation Coefficient (Ratio of 24 Hour to 5 Hour)	Gain in Weight in One Minute	(No Efflorescence Effloresced)
	Pounds Per Square Inch (Newtons)	Per Cent	Per Cent		Grams	
1						No Efflorescence
6					*10*	
11	*8520 (58.8)*	*4.5*	*2.0*	*0.43*		
2						No Efflorescence
7					*12*	
12	*8970 (61.9)*	*4.2*	*1.9*	*0.46*		
3						No Efflorescence
8					*10*	
13	*7150 (49.3)*	*5.5*	*3.0*	*0.55*		
4						No Efflorescence
9					*8*	
14	*7510 (51.8)*	*4.8*	*2.3*	*0.48*		
5						No Efflorescence
10					*8*	
15	*5390 (37.2)*	*4.8*	*2.5*	*0.51*		
AVERAGE	*7510 (51.8)*	*4.8*	*2.3*	*0.49*	*10*	

The brick represented by the test results shown here comply with the Standard Specifications (ASTM C32-93) for Sewer Brick (Grade SM) and Manhole Brick (Grades MS, MM), Building Brick (ASTM C62-92c) (Grades SW, MW, NW), Facing Brick (ASTM C216-92d) (Grades SW, MW), and Pedestrian Light Traffic Paving Brick (ASTM C902-93) (Class(es) MX, NX, SX (If molded) Type I, II, III).

No.	Abrasion Index
1	0.023
2	0.021
3	0.042
4	0.031
5	0.046
Avg.	0.033

Respectfully submitted,

Gary C. Rhinehart

Glen-Gery Corporation
Technical Services/Research
Route 61
P.O. Box 340
Shoemakersville, PA 19555
610/562-3076
Fax: 610/562-2084

22 July 1996

Public Works Director
P. O. Box 144
Addison, Texas 75001

ATTN: John Baumgartner

REFERENCE: Addison Circle
Dealer/Distributor: Metro Brick

Dear Mr. Baumgartner,

The Shillington Modular Paver Solid (2-1/4" X 3-5/8" X 7-5/8") (Lot Number: 11260D) size units as manufactured by the Iberia Plant of the Glen-Gery Corporation meet ASTM Designation: C902-95, the Standard Specification for Pedestrian and Light Traffic Paving Brick, Class SX, Type I, Application PS.

Truly yours,

George Robinson.

George Robinson
Director of Technical Services

gr:jy

cc: Midwest Regional Sales Office
Iberia Plant

[illegible] Laboratories, Inc.

610 WILLOW STREET
HARRISBURG, PENNSYLVANIA 17101
PHONE: 238-9331

Laboratory Test No. *IB-783* Date *April 18, 1996*

To *GLEN-GERY CORPORATION*

Brick Identification *SHILLINGTON PAVER 7 5\8 X 3 5\8 X 2 1\4 MOLDED 11260D 110392*

The following is a report of Tests on Building Brick conducted in accordance with ASTM Designation C67-94 "Standard Method of Sampling and Testing Brick"

Sample Received *04-04-96* (Date) From *IBERIA PLANT* (Plant) Test Completed *April 18, 1996* (Date)

Unit Identification	Compressive Strength (Gross Area/Flatwise)	ABSORPTION			SUCTION RATE	EFFLORESCENCE
		5 Hour Submersion in Boiling Water	24 Hour Submersion in Cold Water	Maximum Saturation Coefficient (Ratio of 24 Hour to 5 Hour)	Oven-Dried Procedure: Gain in Weight in One Minute	(No Efflorescence) Effloresced)
	Pounds Per Square Inch (MPa)	Per Cent	Per Cent		Grams	
1						No Efflorescence
6					*3*	
11	*7090 (48.9)*	*5.1*	*2.5*	*0.49*		
2						No Efflorescence
7					*3*	
12	*5810 (40.1)*	*4.0*	*1.6*	*0.40*		
3						No Efflorescence
8					*3*	
13	*4710 (32.5)*	*4.9*	*2.4*	*0.49*		
4						No Efflorescence
9					*3*	
14	*5750 (39.6)*	*4.8*	*2.3*	*0.48*		
5						No Efflorescence
10					*2*	
15	*7110 (49.1)*	*3.6*	*1.5*	*0.40*		
AVERAGE	*6090 (42)*	*4.5*	*2.1*	*0.45*	*3*	

The brick represented by the test results shown here comply with the Standard Specifications (ASTM C32-93) for Sewer Brick (Grade SM) and Manhole Brick (Grades MS, IM), Building Brick (ASTM C62-92c) (Grades SW, MW, NW), Facing Brick (ASTM C216-94a) (Grades SW, MW) and Pedestrian and Light Traffic Paving Brick (ASTM 902-93) (Classes MX, NX, SX if molded) (Types I, II, III).

Abrasion Index

11	0.035
12	0.028
13	0.051
14	0.040
15	0.021

Avg. 0.035

Respectfully submitted,

Gary C. Rohrbaugh

Glen-Gery Corporation
Technical Services/Research
Route 61
P.O. Box 340
Shoemakersville, PA 19555
610/562-3076
Fax: 610/562-2084

22 July 1996

Public Works Director
P. O. Box 144
Addison, Texas 75001

ATTN: John Baumgartner

REFERENCE: Addison Circle
Dealer/Distributor: Metro Brick

Dear Mr. Baumgartner,

The Yorkshire Modular Paver Solid (2-1/4" X 3-5/8" X 7-5/8") (Lot Number: 03513D) size units as manufactured by the Iberia Plant of the Glen-Gery Corporation meet ASTM Designation: C902-95, the Standard Specification for Pedestrian and Light Traffic Paving Brick, Class SX, Type I, Application PS.

Truly yours,

George Robinson.

George Robinson
Director of Technical Services

gr:jy

cc: Midwest Regional Sales Office
Iberia Plant

...Laboratories, Inc.
610 WILLOW STREET
HARRISBURG, PENNSYLVANIA 17101
PHONE: 238-9331

RECEIVED
MAR 31

Laboratory Test No. *IB-572* Date *March 30, 1995*

To *GLEN-GERY CORPORATION*

Brick Identification *YORKSHIRE PAVER 3 5/8 X 2 1/4 X 7 5/8 MOLDED 03513D 3-10-95 75% IBERIA SHALE 25% HOLMES SHALE 3 1/2 MESH*

The following is a report of Tests on Building Brick conducted in accordance with ASTM Designation C67-93a "Standard Method of Sampling and Testing Brick"

Sample Received *3-21-95* (Date) From *IBERIA PLANT* (Plant) Test Completed *March 30, 1995* (Date)

Unit Identification	Compressive Strength (Gross Area/Flatwise)	ABSORPTION			SUCTION RATE	EFFLORESCENCE
		5 Hour Submersion in Boiling Water	24 Hour Submersion in Cold Water	Maximum Saturation Coefficient (Ratio of 24 Hour to 5 Hour)	Oven-Dried Procedure: Gain in Weight in One Minute	(No Efflorescence) Effloresced)
	Pounds Per Square Inch (MPa)	Per Cent	Per Cent		Grams	
1						No Efflorescence
6					*5*	
11	*8720 (60.2)*	*6.9*	*3.6*	*0.52*		
2						No Efflorescence
7					*8*	
12	*8860 (61.1)*	*5.8*	*2.8*	*0.49*		
3						No Efflorescence
8					*8*	
13	*7260 (50.1)*	*8.4*	*4.9*	*0.59*		
4						No Efflorescence
9					*11*	
14	*8550 (59)*	*8.0*	*4.6*	*0.58*		
5						No Efflorescence
10					*9*	
15	*9280 (64)*	*6.4*	*3.3*	*0.51*		
AVERAGE	*8530 (58.9)*	*7.1*	*3.8*	*0.54*	*8*	

The brick represented by the test results shown here comply with the Standard Specifications (ASTM C32-93) for Sewer Brick (Grade SM) and Manhole Brick (Grades MS, MM), Building Brick (ASTM C62-92c) (Grades SW, MW, NW), Facing Brick (ASTM C216-92d) (Grades SW, MW) and Pedestrian and Light Traffic Paving Brick (ASTM C902-93) (Classes SX, MX, NX) (Types I, II, III).

Abrasion Index	
11	0.041
12	0.032
13	0.067
14	0.054
15	0.036
Avg. 0.046	

Respectfully submitted,

Gary C. Rhinehart

Sasaki Associates, Inc. F a c s i m i l e T r a n s m i t t a l

Planning
Architecture
Landscape Architecture
Urban Design
Transportation Planning
Civil Engineering
Environmental Services
Interior Design
Graphic Design

8/6/96
Date

Addison Circle Rond Point SA #51443.00
Project name/number

John Baumgartner — cc: AF
To

Town of Addison
Company

~~9316643~~ 450-2837
Facsimile number — Voice number

Nancy Fleming Armstrong
From

2 — 3:55 PM
Number of pages transmitted (including transmittal) — Time

Transmitted by — Extension

As per your request, attached is a response regarding the ADA detectable warning surface. Sasaki believes that it is not a design (aesthetics) issue, but a safety and regulatory issue.

File
Sasaki
Thanks
JB

Copies Via FAX:

Carmen Moran
Bryant Nail
Andy Oakley
Chris Terry
8-11-96

1925 San Jacinto Street
Dallas, Texas
75201

Telephone 214 922 9380
Facsimile 214 954 0687

Sasaki Associates, Inc. M e m o r a n d u m

Date 8/6/96

Project Addison Circle Rond Point SA# 51443.00

Subject ADA Detectable Warning Strips

From Nancy Fleming Armstrong

To John Baumgartner
cc: A. Fujimori, D. Kenney

I am in receipt of your letter and attachments dated August 5, 1996 from Andy Oakley.

Andy is correct in stating that the Texas Accessibility Standards (TAS) effective April 1, 1994 placed the detectable warning on "reserved" status.

Sasaki had 2 projects reviewed by the Texas Department of Licensing and Regulation in Austin during 1995. As a result of those reviews, even though the truncated dome texture was not required, a visual and/or textural definition was required in hazardous areas.

We suggest that Huitt-Zollars also speak with the Texas Department of Licensing and Regulation regarding their interpretation of the Mews condition. The Department requires a sumittal of the plans and have, in our experience, been more stringent in their interpretation and enforcement.

They can be reached at:

Texas Department of Licensing and Regulation
Policies and Standards Division
Architectural Barriers
P. O. Box 12157
Austin, TX 78711
512.463.3211
512.475.2886 fax

1925 San Jacinto Street
Dallas, Texas
75201

Telephone 214 922 9380
Facsimile 214 954 0687

TOWN OF
ADDISON

PUBLIC WORKS DEPARTMENT (214) 450-2871

Post Office Box 144 Addison, Texas 75001 16801 Westgrove

August 5, 1996

Nancy Fleming-Armstrong
Sasaki Associates, Inc.
1925 San Jacinto Street
Dallas, Texas 75201

Re: Detectable Warning Strips

Dear Nancy:

Please review the attached request from Huitt-Zollars/Addison Circle One Ltd., and provide us with your comments and recommendation regarding the elimination of the detectable warning strips.

In the past, Alan Fujimori had a relatively definitive opinion that they should be included. However, this information from Andy may modify his opinion.

Thank you for your assistance.

Sincerely,

John R. Baumgartner, P.E.
Director of Public Works

cc: Carmen Moran
Bryant Nail
Andy Oakley

HUITT-ZOLLARS

Huitt-Zollars, Inc. / 3131 McKinney Avenue / Suite 600 / LB 105 / Dallas, Texas 75204-2416 / 214/871-3311 / FAX 214-0757

July 19, 1996

Mr. John R. Baumgartner, P.E.
Director of Public Works
Town of Addison
16801 Westgrove Drive
P.O. Box 144
Addison, Texas 75001

RE: Addison Cirele Phase I
Detectable Warning Strip
HZI Project No. 01-1822-04

Dear John:

The current design plans for the above referenced project show a 3 foot wide detectable warning strip on the Witt and Paschal Mews. It was our belief at the time of design that this warning strip was required in areas where there was no vertical separation between vehicular and pedestrian traffic. Further investigation has revealed that this requirement has been suspended for further study because initial studies indicate that the warning strip provides minimal increased safety to a visually impaired person.

The Texas Accessibility Standards (TAS) dated April 4th, 1994 (See Exhibit "A") indicates the section on detectable warnings at hazardous vehicular areas is "reserved" meaning that there is no standard at this time. Our original inclusion of a warning strip in this design was based on a reference in the July 1991 Federal Register (See Exhibit "B") which indicated a requirement for a three foot strip between vehicular and pedestrian traffic when the surfaces are not separated by curbs, railings or other elements.

On July 18, 1996 Huitt-Zollars contacted the Office of Technical and Information Services Architectural and Transportation Barriers Compliance Board in Washington, D.C. for clarification on this issue. Ms. Earlene Sesker a technical service assistant with the board stated that the requirement for vehicular warning strips has been suspended until July of 1998 pending additional studies (See Exhibit "C"). Ms. Sesker also stated that any project constructed prior to July 1998 is not required to construct the detectable warning to be in compliance with the barrier standards.

We realize that the Town of Addison has concerns about the mixture of pedestrian and vehicular traffic, however, the grooved warning strip does not provide a physical barrier to prevent this mixture. The trees and bollards have been spaced in such a way to separate the pedestrian and vehicular traffic. The detectable warning strip is not a proven tool to assist the visually impaired as stated by the Federal Register and therefore the design team requests that these warning strips be deleted from the Witt Mews and Paschal Mews and replaced with a sidewalk sub-base and brick(pattern dependent).

Please call if you have any questions.

Sincerely,

HUITT-ZOLLARS, INC.

Andrew C. Oakley

Andrew C. Oakley, P.E.
Senior Vice President

ACO/dm

Attachment
cc: Bryant Nail

G:\PROJ\01182204\JB0719.LTR

TEXAS ACCESSIBILITY STANDARDS (TAS)

of the

Architectural Barriers Act
Article 9102, Texas Civil Statutes

Effective April 1, 1994

Prepared and Administered by the

TEXAS DEPARTMENT OF LICENSING AND REGULATION
Policies and Standards Division
ARCHITECTURAL BARRIERS SECTION

P. O. Box 12157
Austin, Texas 78711

920 Colorado, Fourth Floor, Austin, Texas 78701

(512) 463-3211 Fax (512) 475-2886

December 17, 1993

EXHIBIT "A" PAGE 1

TEXAS DEPARTMENT OF LICENSING AND REGULATION

Policies and Standards Division
ARCHITECTURAL BARRIERS
P.O. Box 12157 Austin, Texas 78711 (512)463-3211 FAX (512)475-2886

January 7, 1994

IMPORTANT NOTICE

The Texas Commission on Licensing and Regulation, at its December 17, 1993 meeting, adopted the Texas Accessibility Standards (TAS) for purposes of administering the state Architectural Barriers Act, Article 9102, Texas Civil Statutes.

TAS is based on the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and applies to subject buildings and facilities constructed on or after April 1, 1994. Subject buildings and facilities where commencement of construction occurs prior to April 1, 1994 are covered by the current state accessibility standards.

The expressed purpose of TAS is to satisfy legislative intent requiring the department to adopt accessibility standards consistent with federal standards.

Building owners and design professionals who have become accustomed to using ADAAG will find that TAS has merged the federal and state standards while maintaining the federal numbering system. In actuality, all of the requirements necessary for complying with ADAAG are included in TAS. Therefore, the department believes utilizing TAS will also satisfy ADAAG and therefore intends to pursue equivalency certification from the United States Department of Justice.

Copies of TAS can be purchased from:

Office of the Secretary of State
Texas Register Division
P.O. Box 13824
Austin, Texas 78711-3824

(512) 463-5561 FAX (512) 463-5569
TDD (800) 735-2989

Cost per copy: $10.00
Check, Visa, and Mastercard are accepted

EXHIBIT "A" PAGE 2

(7) In general, no place in any room or space required to have a visual signal appliance shall be more than ft (15 m) from the signal (in the horizontal plane). In large rooms and spaces exceeding 100 ft (30 m) across, hout obstructions 6 ft (2 m) above the finish floor, such as auditoriums, devices may be placed around the imeter, spaced a maximum 100 ft (30 m) apart, in lieu of suspending appliances from the ceiling.

(8) No place in common corridors or hallways in which visual alarm signalling appliances are required shall more than 50 ft (15 m) from the signal.

8.4* **Auxiliary Alarms.** Units and sleeping accommodations shall have a visual alarm connected to the ding emergency alarm system or shall have a standard 110-volt electrical receptacle into which such an alarm be connected and a means by which a signal from the building emergency alarm system can trigger such an iliary alarm. When visual alarms are in place the signal shall be visible in all areas of the unit or room. ructions for use of the auxiliary alarm or receptacle shall be provided.

9 Detectable Warnings.

9.1 General. Detectable warnings required by 4.1 and 4.7 shall comply with 4.29.

9.2* Detectable Warnings on Walking Surfaces. Detectable warnings shall consist of raised truncated domes ı a diameter of nominal 0.9 in (23 mm), a height of nominal 0.2 in (5 mm) and a center-to-center spacing of ıinal 2.35 in (60 mm) and shall contrast visually with adjoining surfaces, either light-on-dark, or dark-on-light.

: material used to provide contrast shall be an integral part of the walking surface. Detectable warnings used interior surfaces shall differ from adjoining walking surfaces in resiliency or sound-on-cane contact.

9.3 Detectable Warnings on Doors to Hazardous Areas. (RESERVED).

9.4 Detectable Warnings at Stairs. (RESERVED).

9.5 Detectable Warnings at Hazardous Vehicular Areas. *(RESERVED)*

9.6 Detectable Warnings at Reflecting Pools. *(RESERVED)*

9.7 Standardization. (RESERVED).

) Signage.

).1* General. Signage required to be accessible by 4.1 shall comply with the applicable provisions of 4.30.

).2* Character Proportion. Letters and numbers on signs shall have a width-to-height ratio between 3:5 and and a stroke-width-to-height ratio between 1:5 and 1:10 *using an upper-case "X" for measurement. Lower : letters are permitted.*

).3 *Overhead Signs.* Characters and numbers on *overhead* signs shall be sized according to the viewing ance from which they are to be read. The minimum height is measured using an upper case X. Lower case racters are permitted.

Table 5

Height Above Finished Floor	Minimum Character Height
Suspended or Projected Overhead in compliance with 4.4.2	3 in (75 mm) minimum

EXHIBIT "A" PAGE 3

Federal Register

Friday
July 26, 1991

Part III

Department of Justice

Office of the Attorney General

28 CFR Part 36

Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities; Final Rule

EXHIBIT "B" PAGE 1

4.29 Detectable Warnings.

4.29.1 General. Detectable warnings required by 4.1 and 4.7 shall comply with 4.29.

4.29.2* Detectable Warnings on Walking Surfaces. Detectable warnings shall consist of raised truncated domes with a diameter of nominal 0.9 in (23 mm), a height of nominal 0.2 in (5 mm) and a center-to-center spacing of nominal 2.35 in (60 mm) and shall contrast visually with adjoining surfaces, either light-on-dark, or dark-on-light.

The material used to provide contrast shall be an integral part of the walking surface. Detectable warnings used on interior surfaces shall differ from adjoining walking surfaces in resiliency or sound-on-cane contact.

4.29.3 Detectable Warnings on Doors To Hazardous Areas. (Reserved).

4.29.4 Detectable Warnings at Stairs. (Reserved).

4.29.5 Detectable Warnings at Hazardous Vehicular Areas. If a walk crosses or adjoins a vehicular way, and the walking surfaces are not separated by curbs, railings, or other elements between the pedestrian areas and vehicular areas, the boundary between the areas shall be defined by a continuous detectable warning which is 36 in (915 mm) wide, complying with 4.29.2.

4.29.6 Detectable Warnings at Reflecting Pools. The edges of reflecting pools shall be protected by railings, walls, curbs, or detectable warnings complying with 4.29.2.

4.29.7 Standardization. (Reserved).

4.30 Signage.

4.30.1* General. Signage required to be accessible by 4.1 shall comply with the applicable provisions of 4.30.

4.30.2* Character Proportion. Letters and numbers on signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke-width-to-height ratio between 1:5 and 1:10.

4.30.3 Character Height. Characters and numbers on signs shall be sized according to the viewing distance from which they are to be read. The minimum height is measured using an upper case X. Lower case characters are permitted.

Height Above Finished Floor	Minimum Character Height
Suspended or Projected Overhead in compliance with 4.4.2	3 in. (75 mm) minimum

4.30.4* Raised and Brailled Characters and Pictorial Symbol Signs (Pictograms). Letters and numerals shall be raised 1/32 in, upper case, sans serif or simple serif type and shall be accompanied with Grade 2 Braille. Raised characters shall be at least 5/8 in (16 mm) high, but no higher than 2 in (50 mm). Pictograms shall be accompanied by the equivalent verbal description placed directly below the pictogram. The border dimension of the pictogram shall be 6 in (152 mm) minimum in height.

4.30.5* Finish and Contrast. The characters and background of signs shall be eggshell, matte, or other non-glare finish. Characters and symbols shall contrast with their background — either light characters on a dark background or dark characters on a light background.

4.30.6 Mounting Location and Height. Where permanent identification is provided for rooms and spaces, signs shall be installed on the wall adjacent to the latch side of the door. Where there is no wall space to the latch side of the door, including at double leaf doors, signs shall be placed on the nearest adjacent wall. Mounting height shall be 60 in (1525 mm) above the finish floor to the centerline of the sign. Mounting location for such signage shall be so that a person may approach within 3 in (76 mm) of signage without encountering protruding objects or standing within the swing of a door.

4.30.7* Symbols of Accessibility.

(1) Facilities and elements required to be identified as accessible by 4.1 shall use the international symbol of accessibility. The

EXHIBIT "B" PAGE 2

EXHIBIT "C" PAGE 1

U.S. ACCESS BOARD

F • A • X

Date: July 18, 1996

To: DAVID MEYERS

Agency/Division: HUITT-ZOLLARS

Fax: 214 871 0757

Tel: 214 871 3311

From: EARLENE SESKER EXT. 24

Page 1 of 4 Pages

MESSAGE

1331 F Street, N.W., Suite 1000
Washington, D.C. 20004-1111

tel: 202 • 272 • 5434
fax: 202 • 272 • 5447
tty: 202 • 272 • 5449

EXHIBIT "C" PAGE 2

DEPARTMENT OF JUSTICE

Office of the Attorney General

28 CFR Part 36

ARCHITECTURAL AND TRANSPORTATION BARRIERS COMPLIANCE BOARD

36 CFR Part 1191

DEPARTMENT OF TRANSPORTATION

Office of the Secretary

49 CFR Part 37

Americans With Disabilities Act Accessibility Guidelines; Detectable Warnings

AGENCIES: Architectural and Transportation Barriers Compliance Board, Department of Justice, and Department of Transportation.

ACTION: Joint notice of proposed rulemaking.

SUMMARY: The Architectural and Transportation Barriers Compliance Board (Access Board), the Department of Justice, and the Department of Transportation propose to extend the suspension of the requirements for detectable warnings at curb ramps, hazardous vehicular areas, and reflecting pools in the Americans with Disabilities Act Accessibility Guidelines (ADAAG) from July 26, 1996 to July 26, 1998. The Access Board has established an advisory committee to conduct a comprehensive review of ADAAG, including the detectable warning requirements, and plans to initiate rulemaking to revise and update ADAAG based on the advisory committee's recommendations. Extending the suspension date for the detectable warning requirements will allow the Access Board to consider the advisory committee's recommendations and available research data, and to address the detectable warning requirements in the rulemaking to revise and update ADAAG.

DATES: Comments should be received by May 13, 1996. Comments received after this date will be considered to the extent practicable.

ADDRESSES: Comments should be sent to the Office of the General Counsel, Architectural and Transportation Barriers Compliance Board, 1331 F Street, NW., suite 1000, Washington, DC 20004–1111. The Access Board will provide copies of all comments received to the Department of Justice and the Department of Transportation. Comments will be available for inspection at the above address from 9:00 a.m. to 5:30 p.m. on regular business days.

FOR FURTHER INFORMATION CONTACT: Access Board: James J. Raggio, General Counsel, Architectural and Transportation Barriers Compliance Board, 1331 F Street, NW., suite 1000, Washington, DC 20004–1111. Telephone (202) 272–5434 extension 15 or (800) 872–2253 extension 15 (voice), and (202) 272–5449 (TTY) or (800) 993–2822 (TTY).

Department of Justice: The ADA Information Line, Disability Rights Section, Civil Rights Division, U.S. Department of Justice, Washington, DC 20530. Telephone (800) 514–0301 (voice) or (800) 514–0383 (TTY).

Department of Transportation: Robert C. Ashby, Deputy Assistant General Counsel for Regulation and Enforcement, Department of Transportation, 400 7th Street, SW., room 10424, Washington, DC 20590. Telephone (202) 366–9306 (voice) or (202) 755–7687 (TTY).

SUPPLEMENTARY INFORMATION:

Availability of Alternate Formats

Copies of this proposed rule are available in the following formats: standard print, large print, Braille, audio cassette tape, and computer disk. Single copies may be obtained at no cost by calling the Access Board's automated publications order line (202) 272–5434 or (800) 872–2253, pressing 1 on the telephone keypad, then 1 again and requesting publication DW1 (Detectable Warnings Notice of Proposed Rulemaking). Persons using a TTY should call (202) 272–5449 or (800) 993–2822. Please give your name, address, and telephone number when ordering publications. Persons who want a copy in large print, Braille, audio cassette tape, or computer disk should specify the type of format they want.

The proposed rule is available on electronic bulletin board at (202) 272–5448 (Access Board) and (202) 514–6193 (Department of Justice). These telephone numbers are not toll-free numbers.

The proposed rule is also available on the Internet. It can be accessed with World Wide Web software (http://www.usdoj.gov).

Background

The Access Board is responsible for issuing guidelines to assist the Department of Justice and the Department of Transportation in establishing accessibility standards for newly constructed and altered facilities under the Americans with Disabilities Act. In 1991, the Access Board issued the Americans with Disabilities Act Accessibility Guidelines (36 CFR part 1191), which is commonly referred to as ADAAG. Sections 1 through 10 of ADAAG have been adopted as the accessibility standards for the Americans with Disabilities Act by the Department of Justice (28 CFR part 36) and the Department of Transportation (49 CFR part 37).

As issued in 1991, ADAAG required that a pattern of small, raised truncated domes be built in or applied to walking surfaces at certain locations on a site to warn pedestrians who are blind or visually impaired of hazards on a circulation path. The detectable warnings were required at:

- Curb ramps (ADAAG 4.7.7);
- Hazardous vehicular areas (i.e., where pedestrian ways adjoin vehicular ways and there are no curbs, railings, or other elements separating the pedestrian and vehicular ways) (ADAAG 4.29.5); and
- Reflecting pool edges that are not protected by railings, walks, or curbs (ADAAG 4.29.6).[1]

In April 1994, the Access Board, the Department of Justice, and the Department of Transportation issued a joint rule that suspended the requirements for detectable warnings at curb ramps, hazardous vehicular areas, and reflecting pools until July 26, 1996. 59 FR 17442 (April 12, 1994). This action was taken to allow the agencies to consider the results of a research project on the need for detectable warnings at vehicular-pedestrian intersections. The research project, which was sponsored by the Access Board and was conducted by the Virginia Polytechnic Institute and State University, was completed in January 1995.

The research project showed that vehicular-pedestrian intersections are very complex environments and that pedestrians who are blind or visually impaired use a combination of cues to detect and cross intersections. The research project also showed that the travel skills and experience of the pedestrian who is blind or visually impaired are also important factors in negotiating an intersection. The research project found that detectable warnings helped some pedestrians who are blind or visually impaired locate and identify curb ramps. However, the detectable warnings had only a modest impact on

[1] Detectable warnings were also required at platform edges in train stations that are not protected by platform screens or guard rails (ADAAG 10.3.1 (8)). The requirement for detectable warnings at platform stations in train stations is not affected by this rulemaking action.

EXHIBIT "C" PAGE 3

overall performance because, in their absence, pedestrians who are blind or visually impaired used whatever other cues were available to detect and cross the intersection. The research project indicated that there may be a need for additional cues at some types of intersections. The research project did not identify the specific conditions where such cues should be provided. The research project suggested that other technologies be explored for providing information about intersections, which may be less costly and equally or more effective than detectable warnings.[2]

The Access Board, in cooperation with Project ACTION, has taken steps to further define specific areas of research that are necessary in order to provide adequate information for pedestrians who are blind or visually impaired at crossings, intersections, hazardous vehicular areas, and reflecting pools. A panel of experts representing people who are blind or visually impaired, designers and engineers, educators, researchers, and State and local governments was assembled in June 1995 to review the existing research on pedestrians who are blind or visually impaired and to develop a statement of research needs. It is anticipated that a final statement of research needs will be available by the summer of 1996.

The Access Board has also established an advisory committee to conduct a comprehensive review of ADAAG. The advisory committee has formed several subcommittees, including a communications subcommittee which considered the detectable warning requirements. The subcommittees have presented their recommendations to the full advisory committee which is reviewing the recommendations and will issue a final report to the Access Board by September 1996. The Access Board plans to initiate rulemaking to revise and update ADAAG based on the advisory committee's report in fiscal year 1997. The Access Board intends to address the requirements for detectable warnings in the planned rulemaking to revise and update ADAAG, after considering the advisory committee's recommendations and available research data.

In view of advisory committee's activities and the planned rulemaking to revise and update ADAAG, the Access Board, the Department of Justice, and the Department of Transportation propose to extend the suspension of the detectable warnings requirements at curb ramps, hazardous vehicular areas, and reflecting pools from July 26, 1996 to July 26, 1998. This extension will allow the Access Board to consider the recommendations of the advisory committee that is currently reviewing ADAAG and available research data, and to address the requirements in the planned rulemaking to update and revise ADAAG.

[2] The research project also examined whether detectable warnings introduce barriers to other pedestrians. The research project found that most pedestrians ignored the detectable warnings and no major problems were encountered.

Regulatory Process Matters

The Access Board, the Department of Justice, and the Department of Transportation have independently determined that this proposed rule is not a significant regulatory action under Executive Order 12866. Accordingly, a regulatory analysis is not required. It is a significant rule under the Department of Transportation's regulatory policies and procedures since it amends the agency's Americans with Disabilities Act regulations, which are a significant rule. The Department of Transportation expects the economic impacts to be minimal and has not prepared a full regulatory evaluation.

Executive Order 12875 prohibits agencies from promulgating any regulation that is not required by statute and that creates a mandate upon a State, local, or tribal government unless certain conditions are met. This proposed rule creates no new mandate. Consistent with the spirit of Executive Order 12875, this proposed rule continues the suspension of an existing regulatory requirement to allow for further review of the requirement.

The Access Board, the Department of Justice, and the Department of Transportation have also independently certified under section 605(b) of the Regulatory Flexibility Act that this proposed rule is not expected to have a significant economic impact on a substantial number of small entities because it continues the suspension of an existing regulatory requirement and does not impose any new requirement. Therefore, an initial regulatory flexibility analysis is not required.

Text of Proposed Common Rule

The text of the common rule is revised to read as follows:

§ _____ Temporary suspension of certain detectable warning requirements.

The detectable warning requirements contained in §§ 4.7.7, 4.29.5, and 4.29.6 of appendix A to this part are suspended temporarily until July 26, 1998.

Adoption of Proposed Common Rule

The agency specific proposals to adopt the proposed common rule, which appears at the end of the common preamble, are set forth below.

DEPARTMENT OF JUSTICE

Office of the Attorney General

28 CFR Part 36

List of Subjects in 28 CFR Part 36

Administrative practice and procedure, Alcoholism, Buildings and facilities, Business and industry, Civil rights, Consumer protection, Drug abuse, Historic preservation, HIV/AIDS, Individuals with disabilities, Reporting and recordkeeping requirements, Transportation.

Authority and Issuance

By the authority vested in me as Attorney General by 28 U.S.C. 509, 510; 5 U.S.C. 301; and 42 U.S.C. 12186, and for the reasons set forth in the common preamble, part 36 of chapter I of title 28 of the Code of Federal Regulations is proposed to be amended as follows:

PART 36—NONDISCRIMINATION ON THE BASIS OF DISABILITY BY PUBLIC ACCOMMODATIONS AND IN COMMERCIAL FACILITIES

1. The authority citation for 28 CFR part 36 continues to read as follows:

Authority: 5 U.S.C. 301; 28 U.S.C. 509, 510; 42 U.S.C. 12186(b).

§ 36.407 [Revised]

2. Section 36.407 is revised to read as set forth at the end of the common preamble.

Janet Reno,

Attorney General.

ARCHITECTURAL AND TRANSPORTATION BARRIERS COMPLIANCE BOARD

36 CFR Part 1191

List of Subject in 36 CFR Part 1191

Buildings and facilities, Civil rights, Individuals with disabilities.

Authority and Issuance

For the reasons set forth in the common preamble, part 1191 of title 36 of the Code of Federal Regulations is proposed to be amended as follows:

EXHIBIT "C" PAGE 4

PART 1191—AMERICANS WITH DISABILITIES ACT (ADA) ACCESSIBILITY GUIDELINES FOR BUILDINGS AND FACILITIES

1. The authority citation for 36 CFR part 1191 continues to read as follows:

Authority: 42 U.S.C. 12204.

§ 1191.2 [Revised]

2. Section 1191.2 is revised to read as set forth at the end of the common preamble.

Authorized by vote of the Access Board on February 23, 1996.

John H. Catlin,

Chairman, Architectural and Transportation Barriers Compliance Board.

DEPARTMENT OF TRANSPORTATION

Office of the Secretary

49 CFR Part 37

List of Subjects in 49 CFR Part 37

Buildings and facilities, Buses, Civil rights, Individuals with disabilities, Mass transportation, Railroads, Reporting and recordkeeping requirements, Transportation.

Authority and Issuance

For the reasons set forth in the common preamble, part 37 of title 49 of the Code of Federal Regulations is proposed to be amended as follows:

PART 37—TRANSPORTATION SERVICES FOR INDIVIDUALS WITH DISABILITIES (ADA)

1. The authority citation for 49 CFR part 37 continues to read as follows:

Authority: The Americans with Disabilities Act of 1990 (42 U.S.C. 12101–12213); 49 U.S.C. 322.

§ 37.15 [Revised]

2. Section 37.15 is revised to read as set forth at the end of the common preamble.

Dated: April 5, 1996.

Nancy E. McFadden,

Acting Secretary of Transportation.

[FR Doc. 96–8974 Filed 4–11–96; 8:45 am]

BILLING CODE 4910-01-P, 8150-01-P, 4910-62-P]

Fax Cover Sheet

ACME BRICK
Since 1891

Date: 5/13/96

Attention: John Baumgratner

Company: CITY OF Addison

From: Brad Burks

# of pages ... 3
(including this page)

Comments: Here are test reports we talked about. My engineer will be here Tuesday, thursday & Friday this week. Call me if we should come by to discuss.

Brad Burks
Acme Brick

Please contact our office immediately if you do not receive all of this fax.
Phone 214/241-1400 Fax 214/247-0950

ACME BRICK COMPANY
A Subsidiary of Justin Industries, Inc.
11251 SHADY TRAIL • DALLAS, TEXAS 75229 • TEL.: 214/241-1400

will meet ASTM C1272

ACME BRICK COMPANY
Research and Production Services

PLANT: TUP — 0% void, 6.62 lbs — RECEIVED: 4-16-92

TYPE BRICK: 4x8 Velour Pavers with Luga — REPORTED: 7-24-92

MIX: BL-2 Run 75192

BRICK (NO.)	INITIAL RATE SUCTION (grms/min)	24 HR. WATER ABS. (%)	5 HR. BOIL ABS. (%)	SAT. COEF. (C/B)	COMPRESS. STRENGTH (psi)	BODY FREEZE THAW (ey)	FAILURE MODE
1.	2.0	0.9	1.2	0.75	26,783		
2.	3.4	1.6	2.1	0.76	22,065		
3.	5.6	2.7	3.9	0.69	21,320		
4.	10.6	4.0	5.5	0.73	17,125		
5.	11.7	6.5	8.4	0.77	17,250		
Ave.	6.7	3.1	4.2	0.74	20,911		

A.S.T.M. Specification

	BOIL. AVE.	ABS. IND.	SAT. AVE.	COEF IND.	STRENGTH AVE.	IND.
"SW"	17.0	20.0	0.78	0.80	3000	2500
"MW"	22.0	25.0	0.66	0.90	2500	2200

BURNING TEMPERATURE: Plant

EFFLORESCENCE: Not tested, insufficient samples

FREEZE-THAW: In Test

COMMENT: Brick meet "SW" specifications according to ASTM C902-88a.

CC: Tony Neeves
Dick Lamar
Gary Paup

SUPERVISOR

PLANT: TUP

2

WILL MEET ASTM C902

MAY-03-1995 14:04 918 834 3506 92% P.02 TOTAL P.03

ACME BRICK COMPANY
RESEARCH AND PRODUCTION SERVICES

PLANT: TUP 0 %void 5.23 lbs 2.37 Kg **RECEIVED:** 2-23-96

TYPE BRICK: Solid Mod Velour **REPORTED:** 3-13-96

MIX: BL-2 Run #11896 **F-T COMPLETED:**

BRICK (NO.)	INITIAL RATE SUCTION (gms/min)	24 HR. WATER ABS. (%)	5 HR. BOIL ABS. (%)	SAT COEF. (C/B)	COMPRESS. STRENGTH (psi)	COMPRESS. STRENGTH (MPa)	BODY FREEZE THAW (cyl)	FAILURE MODE
1.	11.7	5.1	6.7	0.76	9,829	67.8		
2.	10.9	4.5	5.8	0.77	13,260	91.5		
3.	14.1	5.3	6.8	0.78	7,928	54.7		
4.	18.1	6.3	7.8	0.81	10,496	72.4		
5.	16.0	5.6	7.1	0.79	10,630	73.4		
Avg.	14.2	5.3	6.8	0.78	10,429	72.0		

	BOIL. AVE.	ABS. IND.	SAT. AVE.	COEF. IND.	STRENGTH PSI AVE. IND.	MPa AVE. IND.
"SW"	17.0	20.0	0.78	0.80	3000 2500	20.7 17.2
"MW"	22.0	25.0	0.88	0.90	2500 2200	17.2 15.2

BURNING TEMP. Plant **EFFLORESCENCE** Effloresced

COMMENT C/B waived; cold water absorption does not exceed 8%.
Brick meet "SW" specifications according to ASTM specifications according to C216-92d.

CC: Tony Neeves
Pete Turnbull
Gary Paup

SUPERVISOR

PLANT: TUP

Sasaki Associates, Inc. F a c s i m i l e T r a n s m i t t a l

Planning
Architecture
Landscape Architecture
Urban Design
Transportation Planning
Civil Engineering
Environmental Services
Interior Design
Graphic Design

3/22/96
Date

Addison Circle SA#51443.00
Project name/number

Bryant Nail
To

Columbus Realty Trust
Company

770.5129
Facsimile number | Voice number

Nancy Fleming Armstrong
From

2 | 8:45 AM
Number of pages transmitted (including transmittal) | Time

Transmitted by | Extension

✓ cc: John Baumgartner, Town of Addison 931.6643 fax

1925 San Jacinto Street
Dallas, Texas
75201

Telephone 214 922 9380
Facsimile 214 954 0687

Glen-Gery Corporation
Technical Services/Research
Route 61
P.O. Box 340
Shoemakersville, PA 19555
610/562-3076
Fax: 610/562-2084

18 April 1996

Metro Brick
[illegible] Addison Road
Dallas, Texas 75248

REFERENCE: Addison Circle
Addison, Texas
Contractor: Columbus Realty
Dealer/Distributor: Metro Brick

To Whom It May Concern,

The Shillington Modular Paver Solid (7-5/8" X 3-5/8" X 2-1/4") size units as manufactured by the Iberia Plant of the Glen-Gery Corporation meet ASTM Designation: C902-93, the Standard Specification for Pedestrian and Light Traffic Paving Brick, Class SX, Type I, Application PS.

Truly yours,

George Robinson

George Robinson
Director of Technical Services

grdy

cc: Kansas City Distribution Center

Certification: 990910.DOC

COLUMBUS REALTY TRUST
DEVELOPMENT DIVISION
770-5151
FAX: 770-5129

MEMORANDUM

TO: Nancy Armstrong, Sasaki & Assoc.

FROM: Bryant Nail

DATE: March 19.1996

RE: **Brick Pavers - Addison Circle**

CC: Andy Oakley, Huitt-Zollars
John Baumgartner, City of Addison

Through our diligence we have found a paver which we feel meets the needs of the city from a maintenance and durability standpoint while at the same time meeting our goal of a material which has character and lends a "patina" to the streetscape.

Please review this at your earliest convenience as I need to arrange for the quantities needed to be available. Thanks

McCreath Laboratories, Inc.

610 WILLOW STREET
HARRISBURG, PENNSYLVANIA (710)

RECEIVED
JUN 27 1994

Laboratory Test No. LB-396 Date June 24 1994

To GLEN-GERY CORPORATION

Brick Identification SERENDIPITY PAVER 7 5/8 X 3 5/8 X 2 1/4 MOLDED 06406 6-3-94

The following is a report of Tests on Building Brick conducted in accordance with ASTM Designation C67-93a "Standard Method of Sampling and Testing Brick"

Sample Received 6-15-94 (Date) From IBERIA (Plant) Test Completed June 24, 1994 (Date)

Unit Identification	Compressive Strength (Gross Area) Pounds Per Square Inch (Newtons)	ABSORPTION: 5 Hour Submersion in Boiling Water, Per Cent	ABSORPTION: 24 Hour Submersion in Cold Water, Per Cent	ABSORPTION: Maximum Saturation Coefficient (Ratio of 24 Hour to 5 Hour)	SUCTION RATE: Gain in Weight in One Minute, Grams	EFFLORESCENCE (No Efflorescence Enforced)
1	8520 (58.8)	4.5	2.0	0.43	10	No Efflorescence
2	8970 (61.9)	4.2	1.9	0.46	12	No Efflorescence
3	7150 (49.3)	5.5	3.0	0.55	10	No Efflorescence
	7510 (51.8)	4.8	2.3	0.48	8	No Efflorescence
	5390 (37.2)	4.8	2.5	0.51	8	
AVERAGE	7510 (51.8)	4.8	2.3	0.49	10	

Brick represented by the test results shown here comply with the Standard Specifications (ASTM C32-93) for Sewer Brick (Grade SM) and Manhole Brick (Grades MS,), Building Brick (ASTM C62-92c) (Grades SW, MW, NW), Paving Brick (ASTM C216-92a) (Grades SW, MW), and Pedestrian Light Traffic Paving Brick (ASTM C902- Class(es) MX, NX, SX (If molded) Type I, II, III)

Abrasion Index
0.023
0.021
0.042
0.051
0.046
0.033

Respectfully submitted,

[signature]

SENT BY:A. S. McCREATH & SON ; 4-19-96 ;

McCreath Laboratories, Inc.

440 YELLOW STREET
HARRISBURG, PENNSYLVANIA 17101
PHONE: 234-8821

Laboratory Test No. 96-291 Date April 18, 1996

To GRAY-GREY CORPORATION

Brick Identification SHELLINGTON PAVER 7 5/8 X 3 5/8 X 2 1/4 MOLDED 112600 110895

The following is a report of Tests on Building Brick conducted in accordance with ASTM Designation C67-94 "Standard Method of Sampling and Testing Brick"

Sample Received 04-04-96 From HARRIS PLANT Test Completed April 18, 1996

Unit Identification	Compressive Strength (Gross Area) Pounds Per Square Inch (MPa)	Absorption 5 Hour Boil Absorption in Boiling Water Per Cent	Absorption 24 Hour Submersion in Cold Water Per Cent	Absorption Maximum Saturation Coefficient (Ratio of 24 Hour to 5 Hour)	Efflorescence Cross-Dried Specimen Gain in Weight in Two Hours Grams	Efflorescence (Dry Efflorescence) Statement
1						No Efflorescence
6					2	
11	7080 (48.8)	5.1	2.5	0.49		
3						No Efflorescence
7					2	
12	5810 (40.1)	4.0	1.6	0.40		
8						No Efflorescence
8					2	
13	4710 (32.5)	4.9	2.4	0.49		
4						No Efflorescence
9					2	
14	5720 (39.4)	4.8	2.3	0.48		
5						No Efflorescence
10					2	
15	7110 (49.1)	5.1	1.5	0.40		
AVERAGE	6080 (42)	4.5	2.1	0.45	2	

The brick represented by the test results shown here comply with the Standard Specifications (ASTM C62-92) for Grade SW and Moderate Brick (Grades MW, MW), Building Brick (ASTM C62-92a) (Grades SW, MW, NW), Facing Brick (ASTM C216-94a) (Grades SW, MW) and Paviors and Light Traffic Paving Brick (ASTM C902-95) (Classes MX, NX, SX if marked) (Types I, II, III).

Absorption Index
1) 0.051
2) 0.051
3) 0.051
4) 0.045
5) 0.021
Avg. 0.051

Respectfully submitted,

Glen-Gery Corporation
Technical Services/Research
Route 61
P.O. Box 340
Shoemakersville, PA 19555
610/562-3076
Fax: 610/562-2084

18 April 1996

Metro Brick
3301 Addison Road
Dallas, Texas 75248

REFERENCE: Addison Office
Addison, Texas
Contractor: Cohiutus Realty
Dealer/Distributor: Metro Brick

To Whom It May Concern,

As requested by our Kansas City Distribution Center, please find enclosed a letter of certification and test report typical of the Shillington Modular Paver Solid (7-5/8" X 3-5/8" X 2-1/4") size units as manufactured by the Iberia Plant of the Glen-Gery Corporation.

Should you require any additional information, please contact the Kansas City Distribution Center. Thank you for your interest in Glen-Gery's line of fine quality products.

Truly yours,

George Robinson

George Robinson
Director of Technical Services

grjy

Enclosures

cc: Kansas City Distribution Center

Certification: 960411B.DOC

Sasaki Associates, Inc. M e m o r a n d u m

Date 1/29/96

Project Addison Circle SA# 51443.00

Subject Brick for Paving

From Nancy Fleming Armstrong

To John Baumgartner
cc: DK, AF, JM

We received your fax dated January 25, 1996 with specifications and test reports attached. A follow-up telephone conversation with Kenneth Roberts at Huitt-Zollars indicated the following clarifications:

1. Bid Schedule II: 1. Item No. 201 states that the pedestrian bricks shall meet....Class SX, Type II. The type intended is Type I, and this specification is in error.

2. Brick Type: 4 X 8 Velour Pavers with Lugs is intended to be the vehicular brick.

3. Brick Type: Solid Mod Velour is intended to be the pedestrian brick.

Based upon the above information, we have found the test reports to be consistent with ASTM C902 - 92 requirements and should be approved for use.

1925 San Jacinto Street
Dallas, Texas
75201

Telephone 214 922 9380
Facsimile 214 954 0687

Sasaki Associates, Inc. M e m o r a n d u m

Date 3/21/96

Project Addison Circle SA# 51443.00

Subject Brick for Paving

From Nancy Fleming Armstrong

To Bryant Nail
cc: John Baumgartner, DK, AF, JM

We received your memorandum dated March 19, 1995 regarding the test results from McCreath Laboratories, Inc. dated October 10, 1995 for the Covington Modular Molded brick from Glen-Gery Corporation. The following are our comments:

1. John Baumgartner's letter to Andy Oakley dated January 22, 1996 stated that the brick paver specification should require a Class SX Type I brick meeting the requirements of Table 1 in ASTM C902-92. The laboratory test report makes no reference to compliance with ASTM C902-92 which is the *Standard Specification for Pedestrian and Light Traffic Paving Brick* and provides no indication of the Class or Type of the Covington brick.

2. This brick is identified as a modular brick, which are modified standards from the ASTM C902-92 Class SX Type I standards. It's reported compressive strength is substantially lower than the Class SX Type 1.

3. It is indicated to be a report of Tests on Building Brick.

Based upon the information contained therein, the Covington brick does not meet the required specifications.

1925 San Jacinto Street
Dallas, Texas
75201

Telephone 214 922 9380
Facsimile 214 954 0687

Sasaki Associates, Inc.
1925 San Jacinto Street, Dallas, Texas 75201 214/922-9380 Fax: 214/954-0687

TRANSMITTAL FORM

To: DART
1401 Pacific Avenue
Dallas, Texas 75266

Date: 1/23/96 Proj. No.: 90515.08
Attention: Connie Santa Cruz
Project: DART Transitway Mall

RECEIVED
JAN 26 1996

We are sending you via:

[ ] Federal Express [ ] U.S. Mail [X] Courier [ ] FAX

Copies	Date	No.	Description
1	02515-049		Granite Cobble Crosswalk Mock-up
1	02515-050		Granite Cobble Grout Color Additive

1-29-96

John,
Do you know what
this is?
R—

These are transmitted as checked below:

[ ] For approval
[ ] For your information
[ ] As requested
[ ] For review and comment
[ ] For bids due _____ 19 _____

[ ] Approved as submitted
[ ] Approved as noted
[ ] Returned for corrections
[ ]

[ ] Resubmit _____ copies for approval
[ ] Submit _____ copies for distribution
[ ] Return _____ corrected prints

Printed returned after loan to us

Remarks:

Signed Paul Weathers

Copy to Tom Howard (fax), CB, LB, SEH,

GILBERT TEXAS CONSTRUCTION CORP.
302 N. MARKET ST.
Dallas, TX 75202
214 748-4595

RECEIVED
JAN 19 1996
BECK Program management, Inc.

LETTER OF TRANSMITTAL
No. 03686

Project: DART CBD MALL Job: 92000193

BECK PROGRAM MANAGEMENT
302 N. Market
Dallas TX 75202
(214)748-8191

January 19, 1996

Attn: TOM HOWARD

Ref: Submittals

X Attached Separate Cover Via: Mail

X Shop Dwg _ Prints _ Plans _ Samples _ Specifications
_ Letter _ Change Order _ Other: MADE FROM SUBMITTAL

No.	Date	Item Number	Description	Status
0	19JAN96	SUB 02515	From: ROC ROC Submittal: 02515-049, Granite Cobble Mock-up w\color Pointing-Color Joints	NEW

These above items are transmitted for your action as noted:

X For Approval	_ For Review And Comment	_ Returned For Corrections	
_ For Your Use	_ Approved As Submitted	_ Resubmit	0 Copies For Approval
_ As Requested	_ Approved As Noted	_ Submit	0 Copy For Distribution
_ Bids Due:	_ Returned After Loan	_ Return	0 Copies Correctd Print

MOCK-UP IS IN-PLACE
AT NE PACIFIC/ERVAY

Having checked this submission, we certify that it conforms to the requirements of the Contract in all respects, except as otherwise indicated.

Transmitted by: GILBERT TEXAS CONSTRUCTION CORP.

Signed: Dan Sloan
By: Dan Sloan
Date: 1-19

JAN 23 '96 10:04 2147487878 PAGE 002

ROC CONSTRUCTION, INC.

705 W. Ave. B Suite 204 • Garland Texas 75040 • (214) 276-4111 • Fax (214) 276-5493

TRANSMITTAL/SUBMITTAL

TO: GILBERT OF TEXAS
302 N. MARKET ST. SUITE 306
DALLAS, TX 75202

DATE: JANUARY 17, 1996

RECEIVED
JAN 23 1996

ATTN. CLARA BECKETT

WE ARE SENDING YOU ATTACHED: MORTAR COLOR SUBMITTALS ASSOCIATES, INC.
RE: DART COBBLESTONES
VIA: U.S. MAIL - FAX

____ Prints	____ Seplas	____ Shop Drawings
____ Samples	__X__ Brochures	____ Bid Documents
____ Architecturals	____ Structurals	____ Certificates/Affidavits
____ Copy of letter	____ Specifications	

Copies	Date	Drawing #	Description
1			Coloring Additive Literature

We are transmitting this:

_X_ For approval	___ Distribute for coordination
___ For revision	___ Proceed with fabrication
___ For information	___ Distribute for construction
___ For bid preparation	___ Return Print(s) of each
___ As requested	___ None Required

The following action is requested:

JOB # _____
FILE _____

Remarks: PLEASE APPROVE ASAP. THANK YOU.

Sincerely,

Romeo O. Collazo, Jr.

Romeo O. Collazo, Jr.
President

02515-050

OTHER DAVIS PRODUCTS:

Integral Colors for Concrete
Davis Color-Seal
True Tone Mortar Colors

DAVIS COLORS

A Subsidiary of Rockwood Industries, Inc.

"COLOR STANDARDS FOR THE CONCRETE INDUSTRY"

WESTERN HEADQUARTERS AND PLANT
3700 E. Olympic Blvd., Los Angeles, California 90023
(213) 269-7311

EASTERN HEADQUARTERS AND PLANT
7011 Muirkirk Road, Beltsville, Maryland 20705 (301) 776-2400

SHOP DRAWING

DIV/SECTION	LOG. NO.	SUBM NO.
02515	050	—

APPROVAL IS ONLY FOR CONFORMANCE WITH THE DESIGN CONCEPT OF THE WORK AND IS RELYING ON THE ACCURACY OF INFORMATION CONTAINED IN THE SUBMITTAL. SEE CONTRACT DOCUMENTS FOR CONTRACTOR'S RESPONSIBILITY FOR DIMENSIONS, QUANTITIES, COORDINATION, REVISED SUBMITTALS, ETC.

- ✓ APPROVED For Color Additive
- APPROVED AS NOTED
- APPROVED EXCEPT AS NOTED
- DISAPPROVED

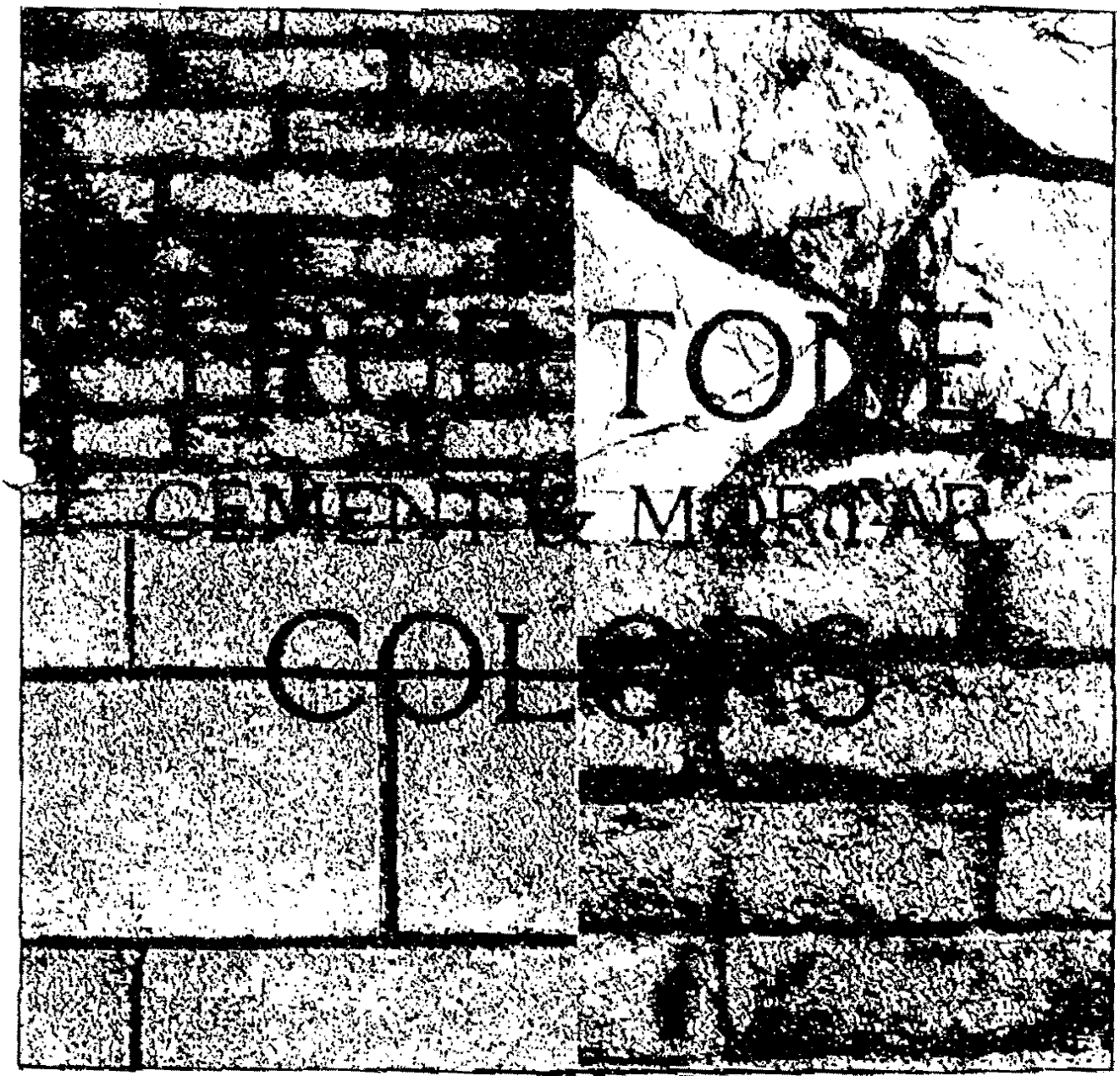
SASAKI ASSOCIATES, INC.
1925 San Jacinto St., Dallas, TX 75201
(214) 922-9380

9051508 | 1.23.96 | gb
SA # | DATE | BY

02515-050

DAVIS COLORS

COLOR STANDARDS FOR THE CONCRETE INDUSTRY



02515-050

COLORING FOR PRECAST CONCRETE/MORTAR
CONCRETE MASONRY/STRUCTURAL CONCRETE
READY MIX CONCRETE / CONCRETE BRICK

1. WHY USE TRUE TONE COLORS?

Over 20% of the visual surface of a brick wall is mortar. The entire wall design must be considered. The use of mortar colors is a highly effective and inexpensive way to add beauty, eye appeal and lasting esthetic value to masonry construction. Color allows greater flexibility in design since it can be used to match, complement, or contrast the unit being used whether it is brick, block, or stone.

2. PRODUCT DESCRIPTION:

True Tone colors are pure pigments, of either the synthetic or the natural variety. They contain no filler or artificial adulterants, and are uniform from shipment to shipment and bag to bag. Because of their extremely small particle size, they have the highest possible tinting strength. They are lightfast, limeproof and weather resistant.

3. BASIC USES:

True Tone colors may be safely used for the coloring of any type of masonry mortar. They are also excellently suitable for the pigmentation of concrete masonry, ready-mixed concrete, precast concrete, stucco, plaster, grouts, terrazzo and similar applications.

4. PACKAGE SIZE:

True Tone colors are available in a variety of package sizes. For use in mortar, the package size is normally that one or two boxes or color are used per bag of masonry cement. On special order, it can be packaged to comply with any custom mix design. Davis colors are also available in bulk packaging, normally a 50 pound bag.

5. COLORS:

In addition to our standard colors, many other colors are available including greens and blues. Our service labs can match any shade you may require. For clean pastel shades, the use of white cement and clean white or light sand is recommended.

6. APPLICATION:

A) WORKMANSHIP — Follow the accepted practices of good masonry construction.

B) TEST PANEL — Sample panels of selected colors should be constructed with jobsite materials for approval.

C) MATERIALS — The color of the fine components of the mix design affects the finished color. Sand of the same type and amount should be used in every batch. Aggregate shall conform to ASTM C 144. Use the same type and brand of cement from the same mill throughout the entire project. Masonry cement shall conform to SS-C-1960/1 or ASTM C91. If cement and lime are used, the cement should comply with ASTM C-150 and the lime ASTM C-207. Water shall be clean and free of deleterious or harmful acids, alkalis or organic materials. Admixtures may affect finished colors. The use of calcium chloride based accelerators and other admixtures containing chloride ions are not recommended with colored mortar systems.

02515-050

D) PROPORTIONS — Use 1 part cement to 2½ to 3 parts sand. All materials including cement, sand, color, and water must be accurately controlled throughout the entire project.

E) MIXING — Color should be mixed in full batches only. With the mixer in operation, the mortar materials shall be batched in the following sequence:

Add approximately 2/3 the required water, ½ the sand, all of the cement, all of the color by weight, then the remainder of the sand. Let the batch mix briefly, and then slowly add enough water to bring the mortar to the proper consistency. Do not over wet. The mixing shall continue for at least 5 minutes after all materials have been added. All batches should be mixed to the same consistency. Avoid retempering of colored mortar if possible.

F) USAGE — It is essential that the mortar be used and placed in final position within 2½ hours after the original mixing 1½ hours on days above 80° F. Time of tooling has a definite effect on the finished color of all mortar joints. For best uniformity, tool all joints at the same degree of hardness. (moisture content) If white cement is required, glass or similar type tools are recommended.

G) CONSISTENCY — Remember consistency is the key to uniform color - consistency in materials, tooling, water and additives is a must. The same methods of application and good workmanship that produces quality regular mortar, will produce quality colored mortar.

7. CAUTIONS:

Dosage should not exceed 10% color based on cement or cement-lime weight. True Tone colors should be stored in a dry place.

8. SUGGESTED SPECIFICATION:

Mortar joints are to be colored with True Tone Cement Color #_____ as manufactured by Davis Colors at the rate of _____ pounds per sack of masonry cement.

9. AVAILABILITY:

True Tone colors are sold by recognized building material dealers, lumber yards, concrete block and ready mix producers throughout the United States.

10. WARRANTY:

Information contained herein is, to our best knowledge, true and accurate, but all recommendations or suggestions are made without guarantee. Since the conditions of use are beyond our control the Davis Colors Company disclaims any liability incurred in connection with the use of our products and information contained herein. No person is authorized to make any statement or recommendation not contained herein, and any such statement or recommendation so made shall not bind the company. Furthermore, nothing contained herein shall be construed as a recommendation to use any product in conflict with existing patents covering any material or its use, and no license implied or in fact is granted herein under the claims of any patents.

02515-050

Sasaki Associates, Inc.

Facsimile Transmittal

Planning
Architecture
Landscape Architecture
Urban Design
Transportation Planning
Civil Engineering
Environmental Services
Interior Design
Graphic Design

1/23/96
Date

DART Transitway Mall SA #90515.08
Project name/number

Steven Solka cc: CB, LB, SEH
To

BECK
Company

748-7876
Facsimile number Voice number

Paul Weathers
From

2 12:52 PM
Number of pages transmitted (including transmittal) Time

Transmitted by Extension

Comments

Reply to Speed Letter concerning TGSq grout color.

1925 San Jacinto Street
Dallas, Texas
75201

Telephone 214 922 9380
Facsimile 214 954 0687

— SPEED LETTER —

URGENT

TO BECK/DART

RECEIVED
JAN 22 1996
12:35pm
BECK Program Management, Inc.

FROM GTCC

SUBJECT GRANITE COBBLES AT T&S RE: JOB NO. C-92000193 68-106

OLD mw1404 7412.04

MESSAGE

DATE 1/22 19 96

GTCC MUST PROCEED PER PLAN UNTIL WE HAVE BEEN DIRECTED IN WRITING TO STOP ~~then~~ WORK. IT IS CRITICAL TO FOLLOW-ON WORK AND TRAFFIC SQUENCING TO PROCEED WITH GRANITE COBBLE INSTALLATION AS SCHEDULED TO AVOID DE-MOBILIZATION/ RE-MOBILIZATION OF OUR STONE SETTER. IT IS OUR UNDERSTANDING THAT THE MORTAR COLOR FOR POINTING HAS BEEN REVIEWED BY THE ARCHITECT AND WAS DEEMED ACCEPTABLE. AS THIS MOCK-UP HAS BEEN REVIEWED, GTCC WILL PROCEED WITH GROUTING JOINTS AT NE PACIFIC/ERVAY ON 1/23 TO ALLOW SUBSIQUENT TRAFFIC PHASING TO CONTINUE UNLESS DIRECTED OTHERWISE.

OLD

SIGNED DAN SLOAN

REPLY

DATE 19

Grout/Mortar color is acceptable.
Ensure full penetration of joints with the grout to eliminate spaces which may lead to failure under heavy traffic.

OLD

Paul Mathews
Sasaki Associates Inc. 1-23-96

SIGNED

Sasaki Associates, Inc.

Facsimile Transmittal

Planning
Architecture
Landscape Architecture
Urban Design
Transportation Planning
Civil Engineering
Environmental Services
Interior Design
Graphic Design

1/23/96
Date

DART Transitway Mall SA #90515.08
Project name/number

Steven Solka cc: CB, LB, SEH
To

BECK
Company

748-7876
Facsimile number Voice number

Paul Weathers
From

2 9:44 AM
Number of pages transmitted (including transmittal) Time

Transmitted by Extension

Comments

RFI #1798

1925 San Jacinto Street
Dallas, Texas
75201

Telephone 214 922 9380
Facsimile 214 954 0687

GILBERT TEXAS CONSTRUCTION CORP.
302 N. Market St.
Dallas, TX 75202
214 748-4595

RECEIVED
JAN 22 1996
BECK Program Management, Inc.

Request for Information #1798
Granite Rug Crown-Pearl Sta.Sdwlk.

Project: DART CBD MALL
BECK PROGRAM MANAGEMENT
302 N. Market
Dallas 75202

Job: 92000193

January 22, 1996

URGENT

TX

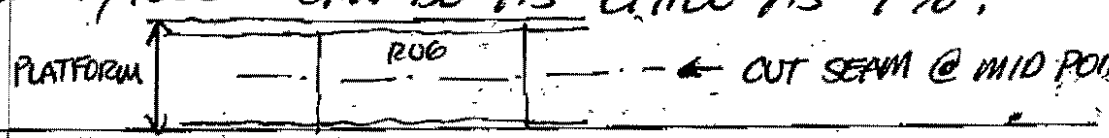
Reference Sheets 809, Rev.1 and 809, Rev.2 and 923, Rev.2:
The Grading Plans indicate a 2% slope/crown in the Sidewalk at the Pearl Stations. The Rug Details/Plans indicate no slope in the North/South direction except at the 2-Platform Stations.
Please Note: A Change Order was issued (CO#321) which would induce a 1/2" crown at these 2 locations. GTCC does not anticipate that a 2" Plus crown will be feasable at the Granite Rugs. Please advise as soon as possible as Granite/Limestone work is scheduled to begin in this area on Tuesday the 23rd of January.
CB

Requested by: GILBERT TEXAS CONSTRUCTION CORP.

Signed: DAN SLOAN
By: Dan Sloan
Date: 1-22-96

ANSWER

BECAUSE THE STATION PLATFORM IS FLAT, A CROWN IS REQUIRED TO ALLOW DRAINAGE. THE STATION RUGS WILL NEED TO HAVE A JOINT CUT AT THE MIDPOINT. THE CROSS SCOPE FROM THE MIDDLE OF THE STATION PLATFORM/RUGS CAN BE AS LITTLE AS 1%.



Answered by: BECK PROGRAM MANAGEMENT

Signed:
By: TOM HOWARD
Date:

Paul Wallace
Sasaki Assoc. Inc.
1.23.96

Quon
Kellerspings

FAX TRANSMITTAL

TO John Baumgartner DATE 1/31/95
FIRM City of Addison
FAX 931-0643 PHONE

FAX COPIES TO

FAX
FAX

RTKL

FROM Jeff Nigh EMPLOYEE NUMBER
DIRECT FAX

PROJECT Addison Circle
PROJECT NUMBER 95509.00
☐ ORIGINAL TO FOLLOW VIA ☐ MAIL ☐ OVERNIGHT ☐

COMMENTS

John,

I have created this letter with answers and forward it to you for review. I am in the process of showing on a set of prints the marks for you to understand what the final set will be. IF this is unacceptable please let me know. Thankyou for your time

RTKL Associates Inc.
2828 Routh Street
Dallas, TX 75201

214 871 8877
FAX 214 871 7023

Jeff Nigh

January 17, 1996

Mr. John Baumgartner, P. E.
Director
Public Works Department
Town Of Addison
16801 Westgrove
Addison, TX 75001

RE: Addison Urban Center
RTKL Project No. 10-95509.00

Dear Mr. Baumgartner:

I have reviewed your comments and have provided the solutions explained below. The responses are located as per your comments. If you have any further comments please let me know, as we are looking forward to obtaining a building permit.

Item 4 Letter A

All balconnettes from the East elevation of building B have been changed to flush metal balconnettes.

Item 4 Letter B

Section 06/32.06 REF 07/31.01- Metal canopy occurs within the set back of the east elevation of building "A".

Section 06/32.06 REF 12/31.02-Metal canopy occurs within the right of way and will be removed.

Item 4 Letter B

Section 02/32.05 REF 03/31.11-Metal balconnette is within the right of way and will be changed to flush balconnette.

Section 02/32.05 REF 12/31.12. This section drawing occurs at the north elevation of "B" building and within a 5'-0" setback.

Section 05/32.05 REF 03/31.01 -This section occurs at the north elevation of "A" building and within the various setback condition. RTKL would like to discuss this condition.

Letter C

Trash Collection: There have been misunderstandings over the proposed trash collection process at Addison Circle. The following is a general description of this process:

Compacted trash is loaded in 2-yard containers with rubber wheels and rolled out to curb across a reinforced section of sidewalk. Through the use of signage, two parallel parking spaces are reserved during set times each week for collection by a one-ton pick-up truck. Once at the curb, these carts roll down a portable ramp carried by the truck and lifted by the truck's back lift gate. Once lifted, these carts are carried to the 40-yard container and emptied.

The following responds to City Staff's comments over trash collection:

Letter C Number 1

Carts from this trash room will be rolled from the garage to the curb at Mildred Street. This process is described above.

Letter C Number 2

Carts from this trash room will be rolled to the curb at Mildred Street. As discussed in the meeting on Fri. 1/19/96, two parking spaces will be reserved in this location as well. This full process is described above.

Letter C Number 3

See above. Carts are loaded by truck parallel parked in reserved spaces. The truck does not block traffic during this process.

Letter C Number 4

The opening provided for servicing of the 40-yard dumpster is 18 feet high, by 12 feet wide. This has been verified as being sufficient for the service vehicle based on the following process: The dumpster is angled within the building. The service vehicle approaches the dumpster at this same angle (+ 30 degrees) and lifts the dumpster while angling it onto the flatbed with its wench assemblies. Based on the vehicles turning radius and length, we have eliminated any trees and street elements in this mews that conflict with this process.

Letter D

The door swing for the meter rooms by code have to swing out. RTKL will change the door swing at the trash rooms if the program allows the change.

Letter E

Owner will provide mirrors or indication lights at the deck entries. A walking surface warming device was denied by the city during past discussions.

Letter F

Bollards at the Porte Cochere will be removed and the height clearance of the Porte Cochere has been increased to 16'-0".

Letter G Number 2

Details will be provided and meters and devices will conform.

Letter G Number 3

Installation details will be furnished.

Letter G Number 4

All meter shall be placed within a traffic safe box/vault.

Letter G Number 5

All backflow presentation devices shall be working properly prior to the issuance of Certificate of Occupancy.

Letter G Number 6

This item is addressed in the reservation agreement between the Town of Addison and Columbus Realty Trust.

Letter G Number 7

Detail will be provided for cleanouts in all sidewalks.

Letter G Number 8

All cleanouts will be located on property lines.

Letter G Number 9

More grease traps will be shown on the drawings at each retail location.

Letter I

Sheet 90.00 indicates the following:

1. Sleeving requirements to future phases for communication and wiring.
2. Telephone, cable and fire alarm routing.
3. Power distribution from transformers to electric rooms.

Sincerely,

RTKL ASSOCIATES INC.

Jeffrey M. Nigh, AIA

JMN:js

cc: John Gosling
File 10-95509.00

Sasaki Associates, Inc.

Memorand

Post-it® Fax Note 7671 | Date 12/14 | # of pages ▶ 2

To ✓ BAUMGARTNER	From ✓ MALONEY
Co./Dept.	Co.
Phone #	Phone #
Fax #	Fax #

Date 12/14/95

Project Addison Urban District

Subject Parking Garages

From Jim Maloney

To John Baumgartner

cc: Carmen Moran, Paris Rutherford (via Fax), Dan Kenney

VIA FACSIMILE TRANSMISSION

Sasaki has designed garages in urban situation with and without sight line clips. The following are our general guidelines related to driveway sight lines that our Watertown office uses in the design of garages in urban situations.

- The structure of the garage/building is "clipped" to provide a "sight triangle" from the driver's side of the vehicle.

OR

- If no sight line clip is provided a "gate" or arm is generally provided which forces the vehicle to stop combined with flashing lights and buzzers. . In addition, a planter or other "obstacle" should be provided along the face of the building to direct the pedestrian far enough away from the face of the building so that they would be visible from the driver's seat of the vehicle.

We have also reviewed a number of technical manuals on the design of parking and parking structures and have found only one standard in Parking Principle, (Highway Research Board etal., 1971).

> "Exit sight distance can best be established by a building line setback of 8 to 10 ft from the public walk or by funneling the walls. An alternative method is to provide sight triangles by use of openings or corner windows (sills should not be more the 3 ft above sidewalks."
>
> It further goes on to note that a pedestrian warning system can be utilized at "blind drives".

We have contacted the cities of San Francisco, Pasadena and Bellevue, and to date have not received any positive feedback on standards regarding this issue. There are still a couple of people you have not returned their calls, but in the interest of providing you with a preliminary response we are forwarding our findings to date. We will provide you with an update if we receive any new information.

1925 San Jacinto Street
Dallas, Texas
75201

Telephone 214 922 9380
Facsimile 214 954 0687

We've also talked with Rod Kelly of Barton Aschman who indicated that he was not aware of any specific standards related to this issue. He did suggest that it would be possible to do an analysis based on a vehicle acceleration speeds, pedestrian speeds and detailed layout of the garage exit and sidewalk, including stopping location of cars, to determine if a "reasonable" sight triangle was being provided.

Please call if you have any questions or would like more input on this matter from Sasaki.

Thanks.

TOTAL COST OF PROJECT (SPECTRUM EXTENSION/AIRPORT-ARAPAHO)

$3,067,812

COST PER DEVELOPER:

$ 630,284/EACH

COST TO TOWN:

$1,804,713

AVAILABLE FUNDS:

BOND MONEY	**$2,300,000**
ADDISON CIRCLE (FUND 41)	**708,000**
DART	**273,000**
INTEREST	**86,000**
TOTAL	**$3,367,000**

FUND TRANSFERS FROM OTHER PROJECTS, IF NEEDED:

INWOOD S. QUORUM	**$ 500,000**
ADDISON ROAD WIDENING	**200,000**
TOTAL	**$ 700,000**

STREET FRONTAGE METHOD:

COST TO TOWN	**$1,807,713**
COST TO TXOK	**$1,069,321 (1340 FEET)**
COST TO STAUBACH	**$ 191,520 (240 FEET)**
COST PER FOOT	**$ 798**

HP LaserJet 3200se

HP LASERJET 3200

SEP-8-2003 2:44PM

Fax Call Report

Job	Date	Time	Type	Identification	Duration	Pages	Result
324	9/ 8/2003	2:43:50PM	Send	7065	0:32	1	OK

TO: RANDY MORAVEC

FROM: MIKE MURPHY

SUBJECT: SPECTRUM EXTENSION

DATE: 8 SEPTEMBER 2003

TOTAL COST OF PROJECT (SPECTRUM EXTENSION/AIRPORT-ARAPAHO)

$3,067,812

COST PER DEVELOPER:

$ 640,159/EACH

COST TO TOWN:

$1,779,463

AVAILABLE FUNDS:

BOND MONEY	$2,300,000
ADDISON CIRCLE (FUND 41)	708,000
DART	273,000
INTEREST	86,000
TOTAL	$3,367,000

FUND TRANSFERS FROM OTHER PROJECTS, IF NEEDED:

INWOOD S. QUORUM	$ 500,000
ADDISON ROAD WIDENING	200,000
TOTAL	$ 700,000

TOTAL COST OF PROJECT: (SPECTRUM EXTENSION)
$ 3,067,812
AIRPORT - ARAP)

COST PER DEVELOPER:

$ 640,159 / EACH

COST TO TOWN:

$ 1,779,463

AVAILBLE:

TOTAL

FUND TRANSF

QUORUM EAST ADDITION
VOL.98001 PG.00033

POST SERVICES, INC.
VOL.98060 PG.03404

TOWN OF ADDISON
VOL.99002 PG.00016

15851 DALLAS NORTH PARKWAY ADDITION
VOL.85021 PG.1686

Exhibit B

5/8" IRF WITH HUITT-ZOLLARS CAP

S 89°05'45"E 5.00'

1/2" IRF WITH "RANDOM" RED PLASTIC CAP BEARS N 89°05'45"W-2.00'

LINE TABLE		
COURSE	BEARING	DISTANCE
L1	N 00° 55' 13"E	65.00'
L2	S 89° 05' 45"E	34.50'
L3	N 89° 04' 47"W	34.50'

PARCEL 2
0.5702 AC.

NOTE:
Improvements were not located for this exhibit and there may be easements and other matters of record that affect this tract.

719.97'

719.98'

724.97'

N 00°55'13"E

(PROPOSED) SPECTRUM DRIVE

69' R.O.W. (PROPOSED)

5.0'

34.5'

740'

550'

TOTAL 1170'

1080'

(TRACT III)
TEXOK PROPERTIES, L.P.
VOL.2002240 PG.03529

(TRACT II)
TEXOK PROPERTIES, L.P.
VOL.2002240 PG.03529

5' SIDEWALK EASEMENT
(PARCEL 2A - 0.0832 AC.)

FISHER SURVEY A82

N 00°55'13"E

S 00°55'13"W

240'

G. W. ABST.

POINT OF BEGINNING
PARCEL 2 & PARCEL 2A
5/8" IRF WITH HUITT-ZOLLARS CAP

(0.0697 AC.)
SPECTRUM DRIVE RIGHT-OF-WAY DEDICATION
VOL.2000036 PG.02913

N 89°04'47"W 5.00'

5/8" IRS

L3

L1

44'

21'

69' R.O.W.

(3.371 AC.)
THE STAUBACH COMPANY
VOL.2000046 PG.02903

TXU ELECTRIC COMPANY EASEMENT BY PLAT VOL.2000036 PG.02913

POINT OF COMMENCING
"X" CUT SET IN BRICK PAVERS

S 00°55'13"W 5.00'

THE ASHTON
VOL.2000036 PG.02913

LOT 1, BLOCK A

10' PRIVATE COMMUNICATIONS EASEMENT BY PLAT - VOL.2000036 PG.02913

MORRIS AVENUE

61' R.O.W.

LOT 5 | LOT 4 | LOT 3 | LOT 2
BLOCK E

45' R.O.W.

MILDRED PLACE

AMENDED PLAT
ADDISON CIRCLE
PHASE II
VOL.2000153 PG.00015

SPECTRUM DRIVE

LOT 1, BLOCK D

LOT 1, BLOCK E

LEGEND
IRS = Iron Rod Set with Huitt-Zollars yellow plastic cap
IRF = Iron Rod Found

STATE OF TEXAS REGISTERED
ERIC JOHN YAHOUDY
4862
PROFESSIONAL LAND SURVEYOR

This is to certify that the above survey was made under my supervision on November 5, 2002 and that the metes and bounds shown thereon are true and correct to the best of my knowledge.

5-1-03

Eric J. Yahoudy, Registered Professional Land Surveyor, Texas No. 4862
Revised owner's name: 3/14/2003
Revised Parcel: 5/01/2003

0 100 200
SCALE:1"=100'

BASIS OF BEARINGS:
The monuments found as called for on the amended plat of Addison Circle Phase II, an addition to the Town of Addison, Texas, as recorded in Volume 2000153, Page 00015, Deed Records, Dallas County, Texas.

HUITT-ZOLLARS
Huitt-Zollars, Inc. Dallas
3131 McKinney Avenue, Suite 600
Dallas, Texas 75204-2489
Phone (214) 871-3311 Fax (214) 871-0757

SPECTRUM DRIVE
RIGHT-OF-WAY EXHIBIT & SIDEWALK EASEMENT
TOWN OF ADDISON, TEXAS

Prepared For: TOWN OF ADDISON
16801 Westgrove Dr., Addison, TX 75001

EXHIBIT PARCEL NO. 2
OWNER: TEXOK PROPERTIES, L.P.
AREA: 0.5702 AC. REV. DATE: 5/1/2003

TOTAL PROJECT COST :

3,067,812

TOTAL COST TO DEVELOPER:

790 ft * 1800/ft = 1,422,000

(TOWN CAP) <141,682>

1,280,318

COST PER EACH DEVELOPER

1,280,318/2

= $640,159

TOWNS SHARE:

1/3 (CAP)	=	141,682
290' * 1800/ft	=	522,000
ARAP * RR		1,115,781
		$ 1,779,463

AVAILABLE FUNDS:

BOND MONEY	$ 2,300,000
ADDISON CIRCLE (FUND 41)	708,000
~~INTEREST~~ DART	173,000
INTEREST	86,000
	$ 3,367,000

FUND TRANSFERS FROM OTHER PROJECT IF NEEDED:

INWOOD S. QUORUM	~~570~~ $500,000
ADDISON RD. WIDENING	200,000
TOTAL	$ 700,000

9/19 { Amount Spent Today - $.69 mil
{ Amount Avail Today - $2.1 mil

Funds Available in Addison Circle

Item	M. Facilities Cost	1995 lf cost	Built in Phase 2A	Built in Phase 2B	Funds available	2002 lf cost	lf available
Quorum Drive (2075 lf)	$ 520,000.00	$ 251.00	$ 300,720.00	$ -	$ 219,280.00	$ 600.00	366
Addison Circle East (419 lf)	$ 318,000.00	$ 759.00	$ 318,000.00	$ -	$ -		
Spectrum (1275 lf)	$ 364,000.00	$ 285.00	$ 222,682.00	$ -	$ 141,318.00	$ 1,800.00	79
Esplanade Park	$ 610,000.00		$ 610,000.00	$ -	$ -		
Quorum North Park (0.69 ac)	$ 295,000.00			$ -	$ 295,000.00		
Mews Park (1.43 ac)	$ 675,000.00			$ -	$ 675,000.00		
R Streets (1,880 lf total)	$ 963,000.00	$ 512.00	$ 271,480.00	$ 366,240.00	$ 352,280.00	$ 1,200.00	294
Mews-2 (1275 lf)	$ 624,000.00	$ 489.00	$ 557,927.00	$ -	$ 66,073.00	$ 900.00	74
Addison Circle East (590 lf)	$ 131,000.00	$ 220.00	$ 131,000.00	$ -	$ -		
	$ 4,500,000.00		$ 2,411,809.00	$ 366,240.00	$ 1,721,951.00		

TOTAL COST OF PROJECT (SPECTRUM EXTENSION/AIRPORT-ARAPAHO)

$3,067,812

COST PER DEVELOPER:

$ 630,284/EACH

COST TO TOWN:

$1,804,713

AVAILABLE FUNDS:

BOND MONEY	**$2,300,000**
ADDISON CIRCLE (FUND 41)	**708,000**
DART	**273,000**
INTEREST	**86,000**
TOTAL	**$3,367,000**

FUND TRANSFERS FROM OTHER PROJECTS, IF NEEDED:

INWOOD S. QUORUM	**$ 500,000**
ADDISON ROAD WIDENING	**200,000**
TOTAL	**$ 700,000**

STREET FRONTAGE METHOD:

COST TO TOWN	**$1,807,713**
COST TO TXOK	**$1,069,321 (1340 FEET)**
COST TO STAUBACH	**$ 191,520 (240 FEET)**
COST PER FOOT	**$ 798**

350
300
430
1080

OPINION OF PROBABLE CONSTRUCTION COST
PROJECT: SPECTRUM DRIVE EXTENSION

CLIENT: TOWN OF ADDISON

HUITT-ZOLLARS, INC.
JOB NO. [redacted]
DATE: 25-Jan-02

ITEM	UNIT	UNIT PRICE	SPECTRUM DR. R-1 TO AIRPORT PKWY. 350 LF	SPECTRUM DR. R-2 to R-1 300 LF	SPECTURM DR. MORRIS to R-2 430 LF	SPECTURM DR. Arapaho to R.R. 540 LF	TOTAL QUANTITY	AMOUNT
SUMMARY								
PAVING IMPROVEMENTS			$134,260	$129,705	$180,197	$227,596		$671,758
STREETSCAPE IMPROVEMENTS			$161,134	$160,036	$231,552	$270,632		$823,354
DRAINAGE IMPROVEMENTS			$14,100	$47,677	$88,456	$146,654		$296,886
WASTEWATER IMPROVEMENTS			$11,876	$21,560	$30,476	$0		$63,912
WATER IMPROVEMENTS			$56,688	$77,295	$94,906	$68,235		$297,123
ELECTRICAL IMPROVEMENTS			$12,960	$67,020	$89,700	$117,960		$287,640
COMMUNICATION AND GAS IMPROVEMENTS			$31,365	$21,420	$35,037	$39,168		$126,990
RAILROAD CROSSING						$50,000		$50,000
TRAFFIC SIGNALS						$50,000		$50,000
SUBTOTAL			$422,382	$524,713	$750,324	$970,244		$2,667,663
CONTINGENCIES (15%)			$63,357	$78,707	$112,549	$145,537		$400,149
TOTAL			**$485,739**	**$603,420**	**$862,872**	**$1,115,781**		**$3,067,812**

$1,952,031

+ 222,500 Engr.

$3,290,312

NOTES:
1. Basis for unit prices is Addison Circle Phase 2B plus 10%.
2. Streetscape section west side of Airport north of R-1 is a 5' grass parkway with street trees and 5' concrete sidewalk

% Fee based on Basic Svcs:

$\frac{186,000}{3,067,812} \times 100 = 6.06\%$

% Fee based on all services

$\frac{222,500}{3,067,812} \times 100 = 7.25\%$

Bond Funds Available:

Year	Purpose	Amt.	
2000	Engr	300,000	
2002	Const	1,000,000	Addison Circle to Airport Parkway
2006	Const	1,300,000	Addison Circle to Arapaho Rd.
		2,600,000	

$690,312 Short

OPINION OF PROBABLE CONSTRUCTION COST
PROJECT: SPECTRUM DRIVE EXTENSION

CLIENT: TOWN OF ADDISON

HUITT-ZOLLARS, INC.
JOB NO.
DATE: 25-Jan-02

ITEM	UNIT	UNIT PRICE	SPECTRUM DR. R-1 TO AIRPORT PKWY. 350 LF	SPECTRUM DR. R-2 to R-1 300 LF	SPECTURM DR. MORRIS to R-2 430 LF	SPECTURM DR. Arapaho to R.R. 540 LF	TOTAL QUANTITY	AMOUNT
PAVING IMPROVEMENTS								
MOBILIZATION	LS	$20,000.00	0.22	0.19	0.26	0.33	1.00	$20,000
UNCLASSIFIED STREET EXCAVATION	CY	$9.00	1100	880	1320	3200	6500.00	$58,500
FULL DEPTH SAWCUT EXIST. CONCRETE	LF	$3.00	200			200	400.00	$1,200
REM. & DISPOSE OF EXIST. CONC. PAVEMENT	SY	$15.70	20			20	40.00	$628
REM. & DISPOSE OF EXIST. 4" CONC. SIDEWALK	SY	$10.00	8			8	16.00	$160
6" THICK 650 PSI FLEX REINF. CONC. PAVEMENT	SY	$30.00		75	75		150.00	$4,500
6" THICK 650 PSI FLEX REINF. CONC. DROP SLAB (STREET)	SY	$35.00		75	75		150.00	$5,250
8" THICK 650 PSI FLEX REINF. CONC. PAVEMENT	SY	$37.00	1650	1380	2070	2400	7500.00	$277,500
8" THICK 650 PSI FLEX REINF. CONC. DROP SLAB (STREET)	SY	$44.00	100	100	100	200	500.00	$22,000
6" THICK LIME STAB. SUBGRADE	SY	$4.80	1830	1524	2286	2715	8355.00	$40,104
HYDRATED LIME (33 LBS/SY)	TON	$130.00	30.2	25.1	37.7	44.8	137.80	$17,914
6" 650 PSI FLEX REINF. CONC INTEGRAL CURB	LF	$3.10	700	1460	1040	1040	4240.00	$13,144
6" 650 PSI FLEX REINF. CONC. DRIVE W/WO DROP SLAB	SY	$34.00	50	25	25	50	150.00	$5,100
REINF. CONC. STREET HEADER	LF	$6.00	105		75	105	285.00	$1,710
LONGITUDINAL BUTT JOINT	LF	$5.50	105		75	105	285.00	$1,568
FURNISH VEHICULAR BRICK PAVER, DELIVERED TO SITE	SF	$3.70	900	1575	1575	1800	5850.00	$21,645
FURNISH & INST. BEDDING MAT. & INST. VEHICULAR BRICK	SF	$2.70	900	1575	1575	1800	5850.00	$15,795
4" 3000 PSI COMPRESSIVE REINF. CONC. SIDEWALK	SF	$4.00	1810	144	216	120	2290.00	$9,160
4" 3000 PSI COMPRESSIVE REINF. CONC. SUBBASE (SIDEWALK)	SF	$4.00	3420	5760	8640	10440	28260.00	$113,040
STREET AND TRAFFIC CONTROL SIGNS	EA	$340.00	4	5	7	8	24.00	$8,160
STREET NAME SIGN AND MOUNTING HARDWARE	EA	$490.00	1	1	1	1	4.00	$1,960
STREET SIGN POST, FOUNDATION, MOUNTING HARDWARE	EA	$320.00	5	5	7	9	26.00	$8,320
24" THERMOPLASTIC STOP LINE	LF	$30.00	25			50	75.00	$2,250
TRAFFIC BUTTONS	EA	$4.00	112	94	140	166	512.00	$2,048
STREET BARRICADE	LF	$34.00		1	2		3.00	$102
BARRICADING, SIGNING AND TRAFFIC CONTROL	LS	$10,000.00	0.22	0.19	0.26	0.33	1.00	$10,000
MISC. DEMOLITION	LS	$10,000.00	0.22	0.19	0.26	0.33	1.00	$10,000
PAVING SUBTOTAL			$ 134,260	$ 129,705	$ 180,197	$ 227,596		**$ 671,758**

OPINION OF PROBABLE CONSTRUCTION COST
PROJECT: SPECTRUM DRIVE EXTENSION

CLIENT: TOWN OF ADDISON

HUITT-ZOLLARS, INC.
JOB NO.
DATE: 25-Jan-02

ITEM	UNIT	UNIT PRICE	SPECTRUM DR. R-1 TO AIRPORT PKWY. 350 LF	SPECTRUM DR. R-2 to R-1 300 LF	SPECTURM DR. MORRIS to R-2 430 LF	SPECTURM DR. Arapaho to R.R. 540 LF	TOTAL QUANTITY	AMOUNT
STREETSCAPE IMPROVEMENTS								
IRRIGATION SYSTEM INCL. POWER FOR CONTROLLERS	LF	$15.00	700	584	876	1040	3200.00	$48,000
TREE FENCE	LF	$23.00	442	748	1088	1292	3570.00	$82,110
4" PVC SCH. 40 PERFORATED DRAIN SYSTEM	LF	$22.00	700	584	876	1040	3200.00	$70,400
BENCH	EA	$1,800.00	4	3	5	4	16.00	$28,800
BIKE RACK	EA	$600.00					0.00	$0
TRASH RECEPTACLE	EA	$1,000.00	2	2	2	2	8.00	$8,000
200 GAL. TREE	EA	$1,650.00	26	22	32	38	118.00	$194,700
100 GAL. TREE	EA	$800.00					0.00	$0
PLANTING ALLOWANCE (TREE WELLS)	SF	$4.50	780	1296	1944	2280	6300.00	$28,350
HYDROMULCH	SF	$0.40	14000	11680	17520	20800	64000.00	$25,600
PEDESTRIAN STREET LIGHT FOUNDATION AND CAP	EA	$625.00	10	8	12	12	42.00	$26,250
HANGING LIGHT FOUNDATION POLE	EA	$1,000.00					0.00	$0
HANGING LIGHT POLE	EA	$2,500.00					0.00	$0
BEGA POLE WITH SINGLE LUMINAIRE	EA	$3,100.00	7	5	10	10	32.00	$99,200
BEGA POLE WITH DOUBLE LUMINAIRE	EA	$4,400.00	3	3	2	2	10.00	$44,000
HANGING LIGHT LUMINAIRE	EA	$1,000.00					0.00	$0
STREET LIGHT CONDUIT	LF	$4.00	700	584	876	1040	3200.00	$12,800
STREET LIGHT PULL BOX	EA	$340.00	4	8	4	4	20.00	$6,800
STREET LIGHT CONDUCTOR (Multiple Runs)	LF	$5.00	700	584	876	1040	3200.00	$16,000
BOLLARDS	EA	$400.00				20	20.00	$8,000
FURNISH GLEN GERY PEDESTRIAN BRICK	SF	$2.80	3420	5760	8640	10440	28260.00	$79,128
FURNISH BEDDING MATERIALS AND PLACE PED. BRICK	SF	$1.60	3420	5760	8640	10440	28260.00	$45,216
STREETSCAPE SUBTOTAL			$ 161,134	$ 160,036	$ 231,552	$ 270,632		**$ 823,354**

OPINION OF PROBABLE CONSTRUCTION COST
PROJECT: SPECTRUM DRIVE EXTENSION

CLIENT: TOWN OF ADDISON

HUITT-ZOLLARS, INC.
JOB NO.
DATE: 25-Jan-02

ITEM	UNIT	UNIT PRICE	SPECTRUM DR. R-1 TO AIRPORT PKWY. 350 LF	SPECTRUM DR. R-2 to R-1 300 LF	SPECTURM DR. MORRIS to R-2 430 LF	SPECTURM DR. Arapaho to R.R. 540 LF	TOTAL QUANTITY	AMOUNT
DRAINAGE IMPROVEMENTS								
18" CL. III RCP, INCLUDING EMBEDMENT	LF	$59.40	50	40	40		130.00	$7,722
21" CL. III RCP, INCLUDING EMBEDMENT	LF	$62.70	40	30	30		100.00	$6,270
24" CL. III RCP, INCLUDING EMBEDMENT	LF	$68.20		60		60	120.00	$8,184
27" CL. III RCP, INCLUDING EMBEDMENT	LF	$73.00		240			240.00	$17,520
30" CL. III RCP, INCLUDING EMBEDMENT	LF	$92.00			40		40.00	$3,680
36" CL. III RCP, INCLUDING EMBEDMENT	LF	$105.00			50		50.00	$5,250
39" CL. III RCP, INCLUDING EMBEDMENT	LF	$114.00					0.00	$0
42" CL. III RCP, INCLUDING EMBEDMENT	LF	$130.00			400	800	1200.00	$156,000
60" CL. III RCP, INCLUDING EMBEDMENT	LF	$130.00				60	60.00	$7,800
JUNCTION STRUCTURE	LS	$10,000.00				1	1.00	$10,000
REMOVE & DISPOSE OF EXIST. INLET	EA	$600.00					0.00	$0
6' MOD. REC. CURB INLET W/ REC. TOP FOR BRICK (EXTRA DEPTH)	EA	$2,500.00		2	2	2	6.00	$15,000
10' REC. CURB INLET W/ REC. TOP FOR BRICK (EXTRA DEPTH)	EA	$3,600.00		2	2		4.00	$14,400
STORMWATER MANHOLE	EA	$3,850.00		1	1	1	3.00	$11,550
RCP 60 DEGREE FACTORY WYE CONNECTION	EA	$330.00	2	3	3	2	10.00	$3,300
PIPE TO STRUCTURE CONNECTION	EA	$440.00		1	1	2	4.00	$1,760
PRECAST CONCRETE PLUG	EA	$120.00		1	1		2.00	$240
INLET PROTECTION	EA	$275.00	2	4	4	2	12.00	$3,300
SILT FENCE	LF	$2.20	350	300	430	500	1580.00	$3,476
STABILIZED CONSTRUCTION ENTRANCE	SY	$20.00	200				200.00	$4,000
TRENCH SAFETY DESIGN FOR ALL UTILITIES	LS	$550.00	0.22	0.19	0.26	0.33	1.00	$550
TRENCH SAFETY FOR CONSTRUCTION	LF	$1.10	90	370	560	400	1420.00	$1,562
2" PVC SLEEVE	LF	$4.40	280	220	330	550	1380.00	$6,072
4" PVC SLEEVE	LF	$5.20	140	110	170	280	700.00	$3,640
6" PVC SLEEVE	LF	$6.60	70	60	80	140	350.00	$2,310
5' x 5' TYPE 'Y' INLET	EA	$3,300.00				1	1.00	$3,300
DRAINAGE SUBTOTAL			$ 14,100	$ 47,677	$ 88,456	$ 146,654	47676.50	**$296,886**

OPINION OF PROBABLE CONSTRUCTION COST
PROJECT: SPECTRUM DRIVE EXTENSION

CLIENT: TOWN OF ADDISON

HUITT-ZOLLARS, INC.
JOB NO.
DATE: 25-Jan-02

ITEM	UNIT	UNIT PRICE	SPECTRUM DR. R-1 TO AIRPORT PKWY. 350 LF	SPECTRUM DR. R-2 to R-1 300 LF	SPECTURM DR. MORRIS to R-2 430 LF	SPECTURM DR. Arapaho to R.R. 540 LF	TOTAL QUANTITY	AMOUNT
WASTEWATER IMPROVEMENTS								
8" SDR 26 PVC WASTEWATER LINE INCLUDING EMBEDMENT	LF	$41.00	180	300	430		910.00	$37,310
6" SDR 35 PVC WW LAT. W/ 2-WAY C.O. & CAST IRON LID	EA	$1,650.00	2	2	4		8.00	$13,200
5' DIA. WASTEWATER MANHOLE	EA	$4,500.00		1	1		2.00	$9,000
TV INSPECTION	LF	$1.10	180	300	430		910.00	$1,001
TRENCH SAFETY FOR CONSTRUCTION	LF	$1.10	180	300	430		910.00	$1,001
CONCRETE ENCASEMENT	LF	$40.00	20	20	20		60.00	$2,400
WASTEWATER SUBTOTAL			$ 11,876	$ 21,560	$ 30,476	$ -		**$ 63,912**

WATER IMPROVEMENTS								
CONCRETE BLOCKING	CY	$275.00	0.5	0.5	0.5	0.5	2.00	$550
D.I. CL. 250 IRON FITTINGS	TON	$3,300.00	0.1	0.1	0.1	0.1	0.40	$1,320
6" DIA. PVC AWWA C900, DR 18, CL. 150 WATER PIPE, INCL. EMBED	LF	$21.00	140	130	190	140	600.00	$12,600
8" DIA. PVC AWWA C900, DR 18, CL. 150 WATER PIPE, INCL. EMBED	LF	$23.00		80	130		210.00	$4,830
12" DIA. PVC AWWA C900, DR 18, CL. 150 WATER PIPE, INCL. EMBE	LF	$33.00	350	300	430	400	1480.00	$48,840
12" DIA. PVC AWWA C900, DR 18, CL. 150 WATER PIPE, Incl. Encasement Pipe, By Bore	LF	$100.00				120	120.00	$12,000
6" DIA. RESILIENT SEAT GATE VALVE/BOX	EA	$715.00	4	4	6	4	18.00	$12,870
8" DIA. RESILIENT SEAT GATE VALVE/BOX	EA	$825.00		1	2		3.00	$2,475
12" DIA. RESILIENT SEAT GATE VALVE/BOX	EA	$1,360.00	2	2	4	2	10.00	$13,600
FIRE HYDRANT	EA	$1,540.00	2	2	3	2	9.00	$13,860
CONN. TO EXIST. WATER MAIN (ALL SIZES)	EA	$880.00		1	1	2	4.00	$3,520
1.5" WATER SERVICE, CHECK VALVE, BOXES, METER	EA	$2,100.00	2	2	4	2	10.00	$21,000
2" DOMESTIC SERVICE, METER, BOXES, CHECK VALVE	EA	$2,800.00					0.00	$0
4" DOMESTIC SERVICE, METER, BOX	EA	$11,700.00	1	2	2	1	6.00	$70,200
6" FIRE LINE, CHECK VALVE, BOX, METER	EA	$11,300.00	1	2	2	1	6.00	$67,800
12" X 8" TAPPING SLEEVE VALVE/BOX	EA	$4,000.00	1				1.00	$4,000
24" X 8" TAPPING SLEEVE VALVE/BOX	EA	$4,500.00					0.00	$0
TRENCH SAFETY FOR CONSTRUCTION	LF	$1.10	350	300	430	400	1480.00	$1,628
WATER TEST	LS	$750.00	0.22	0.19	0.26	0.33	1.00	$750
CONCRETE ENCASEMENT	LF	$44.00	30	30	30	30	120.00	$5,280
WATER SUBTOTAL			$ 56,688	$ 77,295	$ 94,906	$ 68,235		**$ 297,123**

OPINION OF PROBABLE CONSTRUCTION COST
PROJECT: SPECTRUM DRIVE EXTENSION

CLIENT: TOWN OF ADDISON

HUITT-ZOLLARS, INC.
JOB NO.
DATE: 25-Jan-02

ITEM	UNIT	UNIT PRICE	SPECTRUM DR. R-1 TO AIRPORT PKWY. 350 LF	SPECTRUM DR. R-2 to R-1 300 LF	SPECTURM DR. MORRIS to R-2 430 LF	SPECTURM DR. Arapaho to R.R. 540 LF	TOTAL QUANTITY	AMOUNT
ELECTRICAL IMPROVEMENTS								
4E6 CONC. ENCASED DUCTBANK, 6" DIA. TYPE DB PVC CONDUIT	LF	$90.00	80	40	80	80	280.00	$25,200
6E6 CONC. ENCASED DUCTBANK, 6" DIA. TYPE DB PVC CONDUIT	LF	$110.00					0.00	$0
8E6 CONC. ENCASED DUCTBANK, 6" DIA. TYPE DB PVC CONDUIT	LF	$140.00		300	430	520	1250.00	$175,000
TUE STANDARD 3-WAY MANHOLE	EA	$16,100.00		1	1	2	4.00	$64,400
TUE STANDARD PRECAST DEEP WELL 25 KV SWITCH PAD	EA	$2,000.00	2	2	2	2	8.00	$16,000
6" DIA. TYPE DB PVC 90 DEG. SWEEPS, 36"	EA	$110.00	16	12	20	16	64.00	$7,040
ELECTRICAL SUBTOTAL			$ 12,960	$ 67,020	$ 89,700	$ 117,960		**$ 287,640**
COMMUNICATION AND GAS								
COMMUNICATION DUCT (INCLUDING INNERDUCT)	LF	$30.60	350	300	430	520	1600.00	$48,960
COMMUNICATION MANHOLES	EA	$7,650.00	2	1	2	2	7.00	$53,550
GAS MAIN	LF	$15.30	350	300	430	520	1600.00	$24,480
COMMUNICATION AND GAS SUB-TOTAL			$ 31,365	$ 21,420	$ 35,037	$ 39,168	21420.00	**$ 126,990**

ADDISON CIRCLE RECONCILIATION, PHASES 1, IIA, IIB

TOTAL COST (TO TOWN)
PHASE I

$4,807,990 AVAILABLE

$3,112,230 COST PLUS CHANGE ORDERS

TOTAL COST (TO TOWN)
PHASE IIA

$1,671,548 AVAILABLE

TOTAL AVAILABLE FOR OTHER SUBPHASES OF PHASE II

$2,482,000

TOTAL SPENT TO DATE ON IIB

STREETSCAPE	**$142,742.60**	**- DOES NOT**
PAVING	**$ 82,274.89**	**INCLUDE FINAL**
UTILITIES	**$104,886.29**	**PAYMENTS FOR**
		EACH.
	$329,903.82	

9/8/03

Developer's Cost for Spectrum Construction

Gap to be funded by Master Facilities agreement 550 feet X $1,760/ft	$ 968,000.00
City's portion (1/3 in 1995)	$ 141,318.00
Remainder to be funded by developers	$ 826,682.00
CityHomes required funding for gap (1/2)	$ 413,341.00
CityHomes mews street to be added 310 X $900/ft	$ 279,000.00
Financial savings to CityHomes	$ 134,341.00

Under the current plan, CityHomes would lose 8 units by putting in the mews street.

ADDISON CIRCLE RECONCILIATION, PHASES 1, IIA, IIB

TOTAL COST (TO TOWN) PHASE I	TOTAL COST (TO TOWN) PHASE IIA
$4,807,990	$1,671,548

TOTAL AVAILABLE FOR OTHER SUBPHASES OF PHASE II

$2,482,000

TOTAL SPENT TO DATE ON IIB

STREETSCAPE	$142,742.60
PAVING	$ 82,274.89
UTILITIES	$104,886.29
	$329,903.82

9/8/03

pts1 CCSAP(1) 1.2.3 09/08 09:36

Display Vendor Claims and Purchase Orders

Vendor 006763 ADDISON CIRCLE III, LTD = II B

Ln#	Claim#	Invoice#	Inv Date	Amount	Check#	Ck Date	PO#	Hold
1	126058	APP 12-STREETS	09/22/00	13,293.45	097032	10/19/00		
2	126059	APP 9-PAVING	09/22/00	6,096.15	097032	10/19/00		
3	125885	APP 11-STREETS	08/25/00	26,901.41	096820	10/13/00		
4	123913	APP 8-STREETSC	07/21/00	10,029.55	095664	08/17/00		
5	123914	APP 10-STREETS	07/21/00	11,722.47	095664	08/17/00		
6	123435	APP 9-STREETSC	06/24/00	40,931.22	095519	08/10/00		
7	121904	APP 8 STREETSC	05/24/00	7,344.59	094485	06/22/00		
8	119654	APP 7-PAVING	03/24/00	212.53	093057	04/20/00		
9	119655	APP 7-STREETSC	03/24/00	12,674.67	093057	04/20/00		
10	119224	APP 6-PAVING	01/26/00	34,263.86	092776	04/06/00		
11	119222	APP 6-STREETSC	01/25/00	1,971.97	092776	04/06/00		
12	117549	APP 5 STREETSC	12/21/99	925.78	091869	02/24/00		
13	117554	APP 5 PAVING	12/21/99	10,071.25	091869	02/24/00		
14	116809	EST 4-STREETSC	12/20/99	17,069.54	091366	02/03/00		
15	116810	EST 4-PAVING	12/20/99	4,421.64	091366	02/03/00		
16	115439	EST 4-UTILITIE	11/30/99	20,992.21	090613	12/30/99		
17	114421	EST 3-UTILITIE	10/31/99	35,987.52	089809	11/18/99		

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254,909.81
74,994.01
329,903.82

4.8 M I
4.2 M II
III = II B

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Display Vendor Claims and Purchase Orders

Vendor 006763 ADDISON CIRCLE III, LTD

Ln#	Claim#	Invoice#	Inv Date	Amount	Check#	Ck Date	PO#	Hold
18	113449	EST 2-UTILITIE	09/30/99	34,045.83	089211	10/21/99		
19	113451	EST 3-PAVING	09/27/99	1,641.37	089211	10/21/99		
20	113452	EST 3-STREETSC	09/27/99	5,149.58	089211	10/21/99		
21	112090	EST 1-UTILITIE	08/31/99	13,860.73	088449	09/23/99		
22	111913	EST 2-STREETSC	08/27/99	1,811.89	088303	09/16/99		
23	111912	EST1-STREETSCA	07/27/99	2,946.07	088303	09/16/99		
24	111914	EST 1-PAVING	07/27/99	1,295.66	088303	09/16/99		
25	111915	EST 2-PAVING	07/27/99	14,242.88	088303	09/16/99		

34,994.01

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L#=Line # detail display, or /=Exit. (RETURN,F#,B#,P#,L#,/)

Display Vendor Claims and Purchase Orders

Vendor 005955 ADDISON CIRCLE II, LTD = IA

Ln#	Claim#	Invoice#	Inv Date	Amount	Check#	Ck Date	PO#	Hold
18	109782	EST 19-PAVING	06/30/99	728.16	086855	07/15/99		
19	110074	100501 #4	06/30/99	67,882.35	087214	07/22/99		
20	108715	100501 #3	05/31/99	220,296.25	086383	06/17/99		
21	108716	EST 18-STREETS	05/31/99	20,680.71	086177	06/17/99		
22	108717	EST 18 PAVING	05/31/99	160.14	086177	06/17/99		
23	107329	EST 17 STREETS	04/30/99	41,174.28	085233	05/13/99		
24	107330	EST 17 PAVING	04/30/99	1,342.30	085233	05/13/99		
25	107799	100501 #2	04/30/99	85,495.85	085578	05/20/99		
26	108523	EST 13 UTILITI	04/25/99	3,932.33	086009	06/10/99		
27	106610	100501 4/13/99	04/13/99	64,690.13	084855	04/22/99		
28	106200	EST 16-PAVING	03/31/99	3,018.72	084449	04/15/99		
29	106201	EST 16-STREETS	03/31/99	-43,177.44	084449	04/15/99		
30	105176	EST 15-STREETS	02/28/99	17,374.27	083758	03/18/99		
31	105177	EST 15-PAVING	02/28/99	791.77	083758	03/18/99		
32	108524	EST 12 UTILITI	02/25/99	3,143.32	086009	06/10/99		
33	103812	EST 14-STREETS	01/31/99	15,950.40	082770	02/11/99		
34	103813	EST 14-PAVING	01/31/99	187.10	082770	02/11/99		

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Display Vendor Claims and Purchase Orders

Vendor 005955 ADDISON CIRCLE II, LTD

Ln#	Claim#	Invoice#	Inv Date	Amount	Check#	Ck Date	PO#	Hold
35	103087	EST 13-PAVING	12/25/98	1,162.39	082273	01/21/99		
36	103088	EST 13-STREETS	12/25/98	22,025.87	082273	01/21/99		
37	102224	PAVING-EST 12	11/25/98	513.78	081734	12/31/98		
38	102230	STREETSCAPE-ES	11/25/98	23,411.79	081734	12/31/98		
39	100676	EST 11/PAVING	10/31/98	1,292.57	080649	11/12/98		
40	100677	EST 11/STREETS	10/31/98	20,768.59	080649	11/12/98		
41	099802	EST 10-PAVING	10/09/98	2,856.16	080128	10/22/98		
42	099803	EST 10 STREETS	10/09/98	13,311.99	080128	10/22/98		
43	098160	#9 PAVING	08/25/98	6,673.71	078939	09/10/98		
44	098161	#11 UTILITIES	08/25/98	27,063.40	078939	09/10/98		
45	098162	#9 STREETSCAPE	08/25/98	7,605.85	078939	09/10/98		
46	097206	#8 STREETSCAPE	07/31/98	673.56	078406	08/20/98		
47	097207	#8 PAVING	07/31/98	17,859.47	078406	08/20/98		
48	097205	#10 UTILITIES	07/25/98	785.82	078406	08/20/98		
49	095900	#7 STREETSCAPE	06/30/98	1,189.96	077505	07/16/98		
50	095901	#7 PAVING	06/30/98	43,747.22	077505	07/16/98		
51	095899	#9 UTILITIES	06/25/98	1,567.90	077505	07/16/98		

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192,510.03

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Display Vendor Claims and Purchase Orders

Vendor 005955 ADDISON CIRCLE II, LTD

Ln#	Claim#	Invoice#	Inv Date	Amount	Check#	Ck Date	PO#	Hold
1	117553	EST 24 PAVING	01/31/00	458.49	091868	02/24/00		
2	117981	EST 25-STREETS	01/31/00	6,013.88	092139	03/09/00		
3	120651	EST 15-UTILITI	01/25/00	27,918.66	093729	05/18/00		
4	117552	EST 23 PAVING	11/30/99	3,342.50	091868	02/24/00		
5	114420	EST 23-STREETS	10/31/99	1,235.79	089808	11/18/99		
6	115440	99-03 #8 FINAL	10/31/99	26,421.23	090517	12/22/99		
7	113445	EST 22-PAVING	09/30/99	187.10	089209	10/21/99		
8	113447	EST 22-STREETS	09/30/99	20,627.28	089209	10/21/99		
9	113456	EST 7/100501	09/30/99	19,365.66	089210	10/21/99		
10	113444	EST 14-UTILITI	09/25/99	180.29	089209	10/21/99		
11	111916	EST 21-PAVING	08/31/99	287.45	088302	09/16/99		
12	111917	EST 21-STREETS	08/31/99	6,694.16	088302	09/16/99		
13	112049	100501 APP 6	08/31/99	28,401.02	088448	09/23/99		
14	111029	EST 20 PAVING	07/31/99	1,490.41	087673	08/19/99		
15	111033	100501 #5	07/31/99	56,359.23	087842	08/19/99		
16	111122	EST 20-STREETS	07/31/99	22,785.74	087673	08/19/99		
17	109781	EST 19-STREETS	06/30/99	17,445.77	086855	07/15/99		

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Display Vendor Claims and Purchase Orders

Vendor 005955 ADDISON CIRCLE II, LTD

Ln#	Claim#	Invoice#	Inv Date	Amount	Check#	Ck Date	PO#	Hold
52	094916	#6 STREETSCAPE	05/31/98	6,207.98	077053	06/18/98		
53	094917	#6 PAVING	05/31/98	33,770.24	077053	06/18/98		
54	094915	#8 UTILITIES	05/25/98	18,693.54	077053	06/18/98		
55	093522	#5 PAVING	04/30/98	35,648.77	076162	05/14/98		
56	093523	#5 STREETSCAPE	04/30/98	2,375.35	076162	05/14/98		
57	093521	#7 UTILITIES	04/25/98	29,988.50	076162	05/14/98		
58	092176	#4 PAVING	03/31/98	32,050.70	075307	04/09/98		
59	092178	#4 STREETSCAPE	03/31/98	-347.11	075307	04/09/98		
60	092177	#6 UTILITIES	03/25/98	21,167.37	075307	04/09/98		
61	091561	STREETSCAPE 3	02/28/98	4,015.73	074694	03/19/98		
62	091563	PAVING 3 2/28/	02/28/98	6,714.69	074694	03/19/98		
63	091562	UTIL 5 2/25/98	02/25/98	17,228.58	074694	03/19/98		

208203.56

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pts1 CCSAP(1) 1.2.3 09/08 09:42

Display Vendor Claims and Purchase Orders

Vendor 005052 ADDISON CIRCLE ONE, LTD

Ln#	Claim#	Invoice#	Inv Date	Amount	Check#	Ck Date	PO#	Hold
1	099891	#9 5/29/98	05/29/98	10,648.14	080129	10/22/98		
2	097208	REQUEST 24/FIN	05/25/98	78,050.86	078564	08/20/98		
3	093519	#8 BOSQUE PARK	04/30/98	7,587.46	075968	05/14/98		
4	093520	#23	04/25/98	18,786.08	075968	05/14/98		
5	092608	BOSQUE PARK #7	03/31/98	28,290.14	075317	04/16/98		
6	091564	REQUEST 22 2/2	02/25/98	10,387.11	074695	03/19/98		
7	073260	PMT 6 9/25/96	09/25/96	162,299.72	062079	10/10/96		
8	072089	RECONCIL REQ #	08/30/96	464.00	061274	09/12/96		
9	072088	REQ #5 8/25/96	08/25/96	229,981.75	061274	09/12/96		
10	067750	ADD CIR EST 1	04/27/96	284,771.78	058264	05/09/96		
11	070305	ADD CIR 3/29/9	03/29/96	352,843.24	060089	07/18/96		

1,184,110.28

Type RETURN=Next page, F#=Forward # pages, B#=Back # pages, P#=Go to page #, L#=Line # detail display, or /=Exit. (RETURN,F#,B#,P#,L#,/)

III = PHASE II B- Streetscape

CITY

$ 191,068

Estimate 1	2,946.07 ✓
2	1,811.89 ✓
3	5,149.58 ✓
4	17,069.54 ✓
5	925.78 ✓
6	1,971.97 ✓
7	12,674.67 ✓
8	7,344.59 ✓
9	40,931.22 ✓
10	11,722.47 ✓
11	26,901.41 ✓
12	13,293.85 ✓

- 142,742.64

48,325.36

25%

$ 142,742.64
82,274.89
104,886.29

$ 329,903.82

1,396,851 x .3043 =
$425,060.70 x 50%
= $212,530.09

REVISED AMOUNT

12/19/2000

618,421.19 x .3043 = $ 188,185.57

FINAL PAYMENT. = $ 45,442.93

G.B Soar (11/01)

9-557-1199

Phase IIB Paving

Estimate 1

2	1,295.66 ✓
3	14,242.88 ✓
4	1,641.37 ✓
5	4421.64 ✓
6	10,071.25 ✓
7	34,263.86 ✓
8	212.53 ✓
9	10,029.55 ✓
	6,096.15 ✓
	82,274.89

$ 333,373.87

X .3043

101,445.67

- 82,274.89

$ 19,170.78

19%

2001

20899.74
45,442.93
23,639.68

$ 89,982.35

REVISED

$ 339,055.62 * .3043 = 103,174.63

Final Pmt = 20,899.74

Utilities IB - Utilities

#1	13,860.73 ✓
2	34,045.83 ✓
3	35,987.52 ✓
4	20,992.21 ✓
	104,886.29

Gibson
214-55-7-1199

435,583.00
X .3043
132,547.91
-104,886.29
27,661.62

.21%

REVISED
422,366 X .3043 = $128,525.97

FINAL PYMT $23,639.68

PHASE I
ADDISON CIRCLE - PUBLIC INFRASTRUCTURE
BID RECONCILIATION
SEPTEMBER 4,1996

Gibson & Assoc. Base Bid	$	3,426,109.44
Selected Alternatives	$	91,555.00
Award	$	3,517,664.44
Change order #1		($352,843.24)
Change order #2		($15,972.01)
Change order #3		$11,317.50
Change order #4		($86,943.06)
Change order #5		($34,696.37)
Change order #6		($12,696.44)
Change order #7		$22,966.41
Change order #8		$18,419.08
Change order #9		$45,013.80
Adjusted contract	$	3,112,230.11

Bid Reconciliation	**Town of Addison**
Phase I Improvements	$2,905,116.31
Offsite Utilities (sewer & drainage)	$78,260.00
Phase II Utilities (sewer & drainage)	$83,840.00
Phase II Streetscape (East side of Quorum)	DELETED
Street Light Installation	$45,013.80
Totals	**$3,112,230.11**

Payments received to date from "Addison Circle I"	$	405,474.00
Rebates paid to "Addison Circle I"	$	352,843.24
Net payment received from "Addison Circle I"	$	52,630.76
Current payment owed to "Addison Circle I"		**($52,630.76)**

NOTE: If a $300,000 transfer from Phase IIA to Phase I we owe Columbus $262,036.89 for construction costs and partial reimbursement of engineering

ADDISON CIRCLE PHASE II FUNDING
SUMMARY
SEPTEMBER 4, 1997

PROJECT	MASTER FACILITIES AGREEMENT	LENGTH	PHASE IIA	LENGTH	FUTURE PHASES	LENGTH
Quorum Drive	$ 520,000	2075 linear feet (1/2 of street)	$ 188,000		$ 332,000	
Addison Circle (Mildred) East of Quorum	$ 318,000	419 linear feet	$ 318,000	419 linear feet	0	0 linear feet
Spectrum	$ 364,000	1275 linear feet	$ 200,000	700 linear feet	$ 164,000	575 linear feet
Addison Circle Open Space (East Mildred)	$ 610,000	1.13 acres	$ 610,000	1.13 acres	0	0 acres
Quorum North Park	$ 295,000	.69 acres	0	0 acres	$ 295,000	.69 acres
Mews Park	$ 675,000	1.43 acres	0	0 acres	$ 675,000	1.43 acres
R-2	$ 270,000	525 linear feet	0	0 linear feet	$ 270,000	525 linear feet
R-3	$ 205,000	400 linear feet	0	0 linear feet	$ 205,000	400 linear feet
R-4	$ 322,000	630 linear feet	$ 268,000	525 linear feet	$ 54,000	105 linear feet
R-5	$ 166,000	325 linear feet	0	0 linear feet	$ 166,000	325 linear feet
M-2	$ 624,000	1275 linear feet	$ 303,000	620 linear feet	$ 321,000	655 linear feet
Addison Circle (Mildred) East of Spectrum	$ 131,000	590 linear feet	$ 131,000	590 linear feet	0	0 linear feet
TOTAL	**$ 4,500,000**		**$ 2,018,000**		**$ 2,482,000**	

Phase IIA Utilities Constructed during Phase I	$ (83,840)
Phase IIA Funds Transferred to Phase A21I (Subject to Council Approval)	$ (300,000)
Quorum Rotary Park (Water Line)	$ 37,388
TOTAL FUNDS AVAILABLE FOR PHASE IIA	$ 1,671,548

ADDISON CIRCLE PHASE IIA
PUBLIC INFRASTRUCTURE
COST RECONCILIATION
SEPTEMBER 4, 1997

DESCRIPTION	TOWN OF ADDISON	COLUMBUS	TOTAL
Bid Package "A"	$ 245,000	$ 817,359	$ 1,062,359
Bid Package "B"	$ 365,000	$ 1,213,971	$ 1,578,971
Bid Package "C"	$ 273,240	$ 810,270	$ 1,083,510
Addison Circle Median Park (Remaining Allowance)	$ 588,308	0	$ 588,308
Design Engineering		$ 398,000	$ 398,000
Construction Inspection Allowance	$ 75,000	0	$ 75,000
Geotechnical Allowance	$ 25,000	0	$ 25,000
Spectrum Street Lighting Allowance	$ 50,000	0	$ 50,000
Addison Circle Street Lighting Allowance	$ 50,000	0	$ 50,000
TOTAL	$ 1,671,548	$ 3,239,600	$ 4,911,148

NOTE: Total Columbus portion of II is $2,841,600 assuming a $300,000 transfer from Phase II A to Phase I is approved.

ADDISON CIRCLE PHASE IIA
PUBLIC INFRASTRUCTURE BID RECONCILIATION
SEPTEMBER 4, 1997

BID PACKAGE "A"	
Jim Bowman Bid	$ 1,062,359
BID PACKAGE "B"	
Jim Bowman Bid	$ 1,578,971
BID PACKAGE "C"	
North Texas Contracting Bid	$ 1,083,540
TOTAL PUBLIC INFRASTRUCTURE	**$ 3,724,840**

BID RECONCILIATION	**TOWN OF ADDISON**	**COLUMBUS**	**TOTAL**
Phase IIA Improvements	$ 826,990	$ 2,841,600	$ 3,668,590
Quorum Rotary Park Waterline	$ 37,388	0	$ 37,388
Addison Circle Median Park	$ 18,862	0	$ 18,862
TOTALS	**$ 883,240**	**$ 2,841,600**	**$ 3,724,840**

* Funding from Addison Circle Median Park - Phase I

TOWN OF ADDISON

SUMMARY OF ADDISON CIRCLE INFRASTRUCTURE COSTS

	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	YTD - June FY2003	TOTAL
Urban Dist. Streets - #85300									
Special Services	-	12,696	-	-	-	-	-	-	
Advertising	-	297	-	-	-	-	-	-	
Engineering	83,596	30,714	112	-	-	-	-	-	
Street Construction/ROW Acq.	1,841,261	1,089,465	114,192	-	-	-	-	-	
Signals	-	100,074	-	-	-	-	-	-	
Total	1,924,857	1,233,246	114,304	-	-	-	-	-	$ 3,272,407
Addison Circle-Phase IIa - #75300									
Special Services	-	-	-	-	-	-	-	-	
Advertising	-	252	-	-	-	-	-	-	
Engineering	-	-	-	-	-	-	-	-	
Street Construction/ROW Acq.	-	-	417,465	291,797	35,115	-	-	-	
Signals	-	-	-	-	-	-	-	-	
Total	-	252	417,465	291,797	35,115	-	-	-	$ 744,829
Bosque Park - #85801									
Special Services	-	-	-	-	-	-	-	-	
Advertising	-	463	-	-	-	-	-	-	
Engineering	-	-	-	-	-	-	-	-	
Land Betterments	-	125,536	429,596	-	-	-	-	-	
Total	-	125,999	429,596	-	-	-	-	-	$ 555,595
Esplanade Park - #85800									
Special Services	-	-	-	-	-	-	-	-	
Advertising	-	-	-	117	-	-	-	-	
Engineering	-	-	-	44,441	-	-	-	-	
Land Betterments	-	-	-	553,562	15,350	-	-	-	
Total	-	-	-	598,120	15,350	-	-	-	$ 613,470
Spectrum Connection - #85300									
Special Services	-	-	-	-	-	-	-	-	
Advertising	-	-	-	-	-	-	-	-	
Engineering	-	-	-	-	-	-	-	-	
Street Construction/ROW Acq.	-	-	-	-	26,400	-	-	-	
Signals	-	-	-	-	-	-	-	-	
Total	-	-	-	-	26,400	-	-	-	$ 26,400
Spectrum Extension - #05301									
Special Services	-	-	-	-	-	-	-	-	
Advertising	-	-	-	-	-	-	-	-	
Engineering	-	-	-	-	-	-	50,944	134,653	
Street Construction/ROW Acq.	-	-	-	-	-	-	-	3,299	
Signals	-	-	-	-	-	-	-	-	
Total	-	-	-	-	-	-	50,944	137,952	$ 188,896
Addison Circle IIb - #95300									
Special Services	-	-	-	-	-	-	-	-	
Advertising	-	-	-	304	-	-	-	-	
Engineering	-	-	-	-	-	-	-	-	
Street Construction/ROW Acq.	-	-	-	83,023	253,368	121,963	-	-	
Signals	-	-	-	-	-	-	-	-	
Total	-	-	-	83,327	253,368	121,963	-	-	$ 458,658
Total All Projects	$ 1,924,857	$ 1,359,497	$ 961,365	$ 973,244	$ 330,233	$ 121,963	$ 50,944	$ 137,952	$ 5,860,055

Updated: 09/08/03