800.759.1879

University Of Houston Science Center

2010 NTRCA Golden Hammer Award

CONTENTS

ENTRY FORM

2010 NTRCA Golden Hammer Awards Official Entry Form

OUTSTANDING COMMERICAL ROOFING PROJECT

CONTRACTORS NAME — Castro Roofing of Texas
ADDRESS — 4854 Olson Dr. Dallas, TX, 75227
PHONE NUMBER — (214)381-8108
NAME OF PROJECT — Science Center
PROJECT OWNER — University of Houston
PROJECT FOREMAN — Jesus Chavez

PROJECT CONSULTANT — Armko Industries, Inc

LIST THE NTRCA ASSOCIATE MEMBERS INVOLVED — Spec Building Materials Corporation
Roofing Supply Group LLC
Shelter Distribution
ABC Supply Company
GAF Material Corporation
Armko Industries, Inc

DATE OF COMMENCEMENT — January 2010.
DATE OF COMPLETION — March 2010.

SUBMITTED BY — Kodi Zene - CDO

"Training the Scientists of Tomorrow... Today."

CLIENT INTRO

University of Houston Science Center

Whether you're embarking on your college career, transferring from another school or pursuing an advanced degree, the University of Houston College of Natural Sciences and Mathematics is a smart choice. Here are some reasons why:

Faculty who create knowledge: Our professors are not only committed to excellent teaching, but also generate new knowledge. These faculty members receive millions of dollars in competitive research funding each year to study some of the most pressing problems facing mankind. As an NSM student, you also have opportunities to help uncover solutions through research.

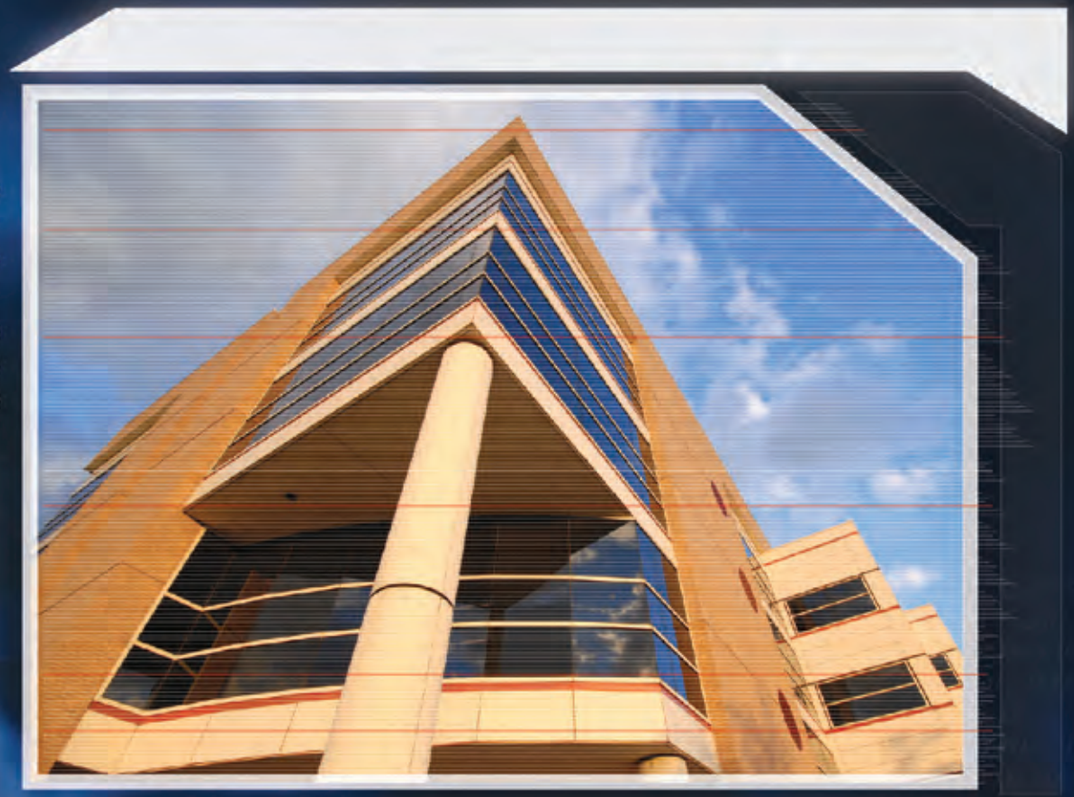
A vibrant, diverse campus: At the University of Houston, one of the nation's most ethnically diverse research universities, you'll meet people from many different backgrounds. You'll find numerous student organizations and campus activities that include a film series, concerts, theatrical productions, art exhibits, NCAA athletics, and an impressive recreation center with an Olympic-sized pool.

Houston – a dynamic city: Minutes from the ocean, the nation's fourth largest city boasts a mild climate conducive to outdoor activity year-round. It features world-class performing arts, museums, a zoo, sports and concerts and international restaurants. The energy capital of the world and home to many Fortune 500 firms, the renowned Texas Medical Center and NASA, Houston also offers numerous employment opportunities.
We invite you to explore our Web site and learn more about the advantages UH and NSM offer.

Project:
University of Houston Science Center
3401 Cullen Boulevard
Houston, Texas 77204

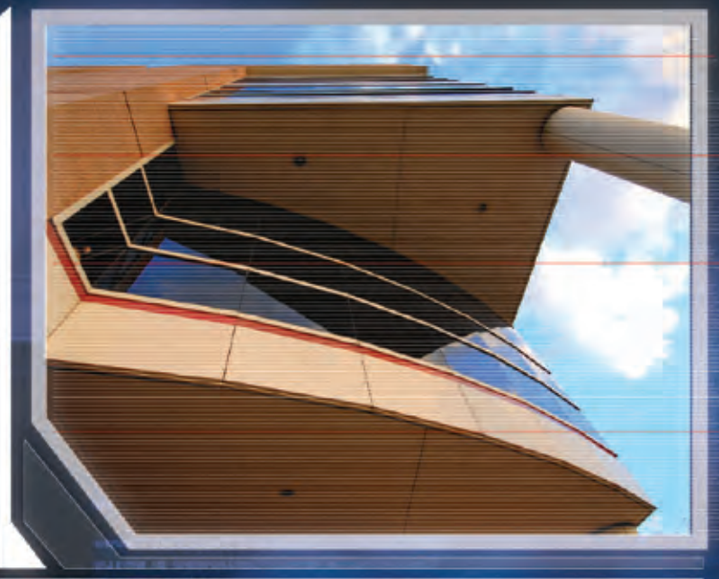
Owner:
University of Houston
4800 Calhoun Rd.
Houston, Texas 77004

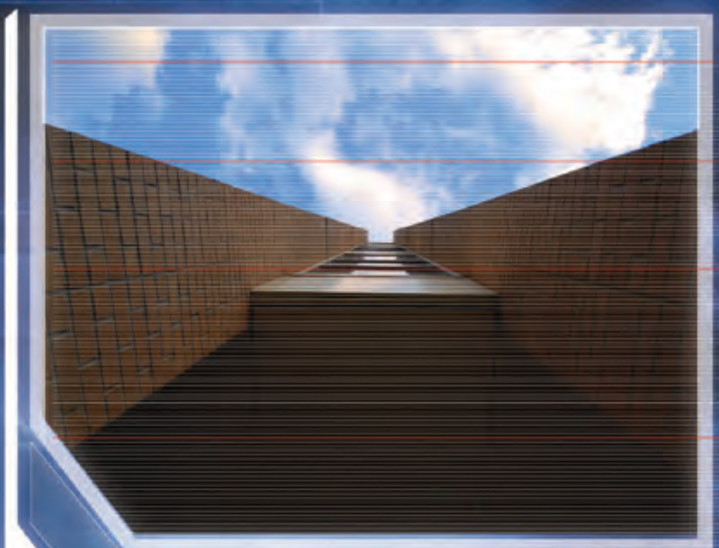
Consultant:
Armko Industries, Inc
1320 Spinks Road
Flower Mound, TX 75028



GENERAL INFO

"One of our most challenging and rewarding projects."





ROOF SYSTEM TYPE:

Removal of existing BUR system

New Roof System:
Fleece-Back Adhered
Thermoplastic
Membrane, wood blocking and
related sheetmetal flashing

LOW-SLOPE ROOF PROCEDURES FLEECE-BACK ADHERED THERMOPLASTIC MEMBRANE:

- Mechanically fastened vented base sheet to lightweight concrete deck.
- Adhere 3" insulation and $^{5}/_{8}$" SECUROCK gypsum fiber roof board with hot asphalt.
- Adhere 3 plies of fiberglass sheets type 6 with hot asphalt.
- Adhere 60mil fleece-back TPO membrane with hot asphalt and heat welded side laps.

OTHER:

- Over 180 Roof Top Units
- 14,400 linear feet of electrical conduit
- 16 foot tall perimeter screen walls
- Multiple roof levels
- Confined set up and roof access
- Roof drain sumps
- 2,500 Sq. Ft. of lighting protection

SIZE OF PROJECT:

- Fleece-Back Adhered Thermoplastic Membrane = 45,500 sq ft
- Total Square Feet = 45,500 sq ft
- Length of project = 63 days
- Completion date = March 2010

UNIQUENESS

Extensive Roof Penetrations

What makes this project unique is the 180 roof penetrations we had to work around without hindering the daily scientific experiments of the Science Center.

This is the old BUR System prior to removal.

New Energy Star Roof

This is the completed roof after the installation of the new high performance energy star roof system, including new walkway protection, sheet metal flashing, reworked electrical conduits and repositioned the lightning protection system.

No Disconnection of Power

The majority of the units had to be lifted 1 inch from the roof's surface to enable the roof membrane to be installed underneath them.

This task had to be accomplished without disconnecting the electrical power, conduits or ductwork on the building.

Successful Solutions

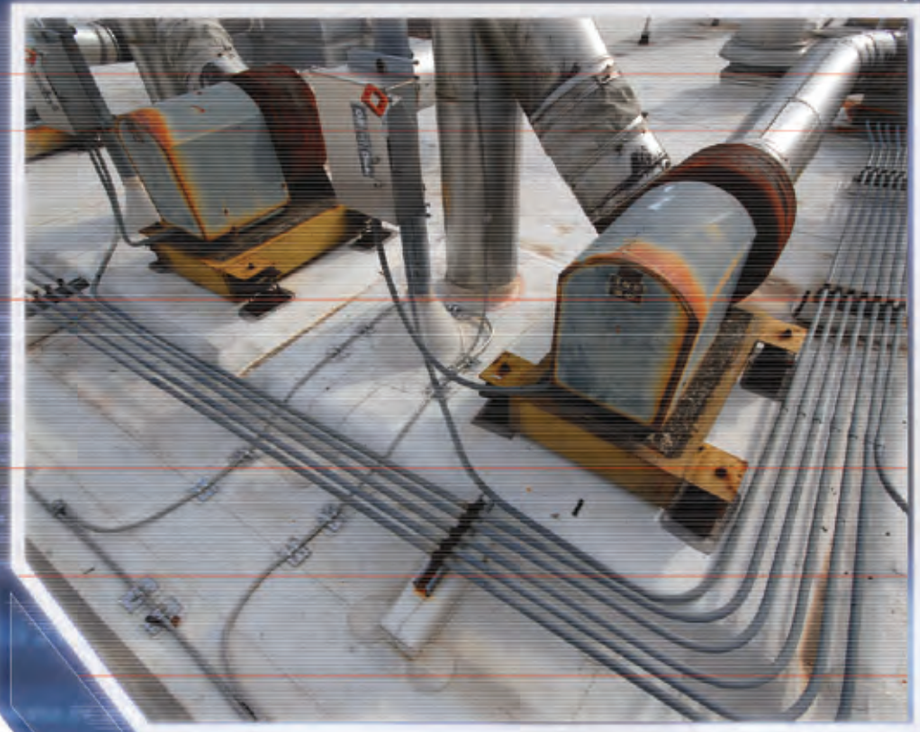
Vast amounts of roof penetrations were extremely close to each other. Some roof top curbs were so close, we filled the gap with insulation to make multiple curbs into one curb.

Over The High Wall

Workers removing the existing roof had to move all roof debris to a single location to be lifted up over the wall then down to the ground for disposal.

100 FT. Climb

This pipe pumps hot asphalt 100 feet up the building then 16 feet down onto the roof. The pipes were insulated to keep the asphalt from cooling and clogging inside the pipe.



14,400 FT. of Electrical Conduit

14,400 feet of electrical conduit had to be raised to remove the existing roof system without disconnection of power. The new roof system had to be carefully installed underneath the electrical conduit. After the roof was completed, the conduit had to be repositioned with the new conduit supports and new protection pads.

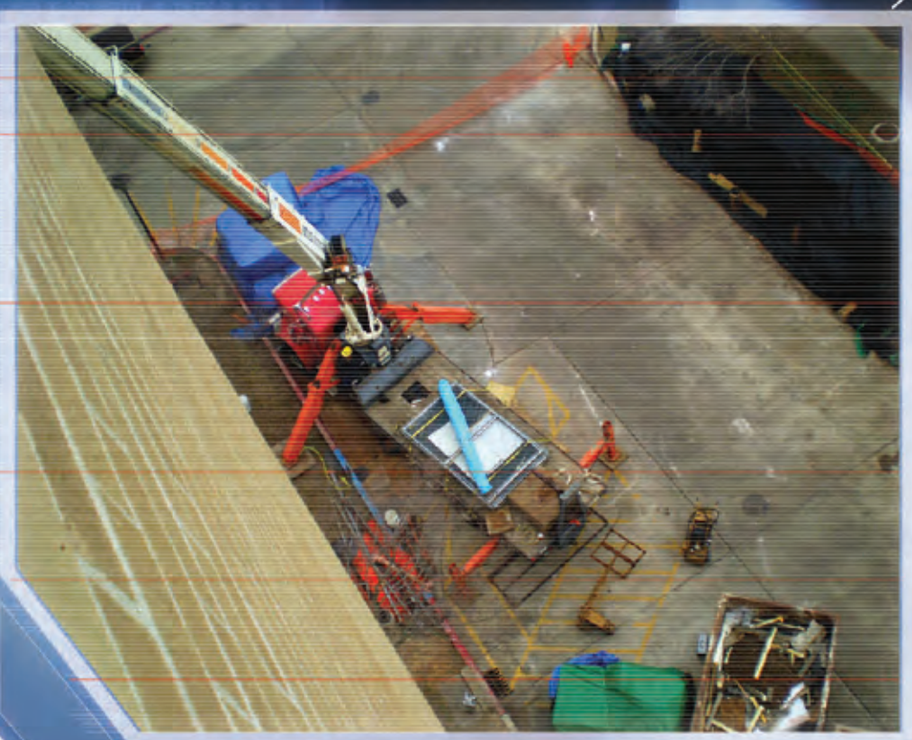
2,400 FT. of Lightning Protection

2,400 feet of lightning protection had to be removed to permit the disposal of the existing roof. After the roof was completed the lightning system had to be re-installed to meet the code requirements.

Confined Set-up Area

The pumping of the hot asphalt up to the top of the building was restricted to only one location on the roof. A set of special safety precautions were taken to prevent pedestrian injury.

CHALLENGES



A View From Above

The working access area was limited to one location for lowering roof debris and raising materials. Access to the loading dock had to be open at all times for other vendors to use.

Wind Diverter

Due to the amount of scientific testing of the building the large amount of fumes released did not disperse quickly.

Wind travels under the wall, hits the wind diverters, then it carries the fumes upwards away from the building.

Special Fume Testing

The diverters had to be repositioned to permit the removal of the exsisting roof and allow installation of the new roof system.

Special testing had to be done to ensure the chemical fume levels were not harmful to any members of the team during the project.

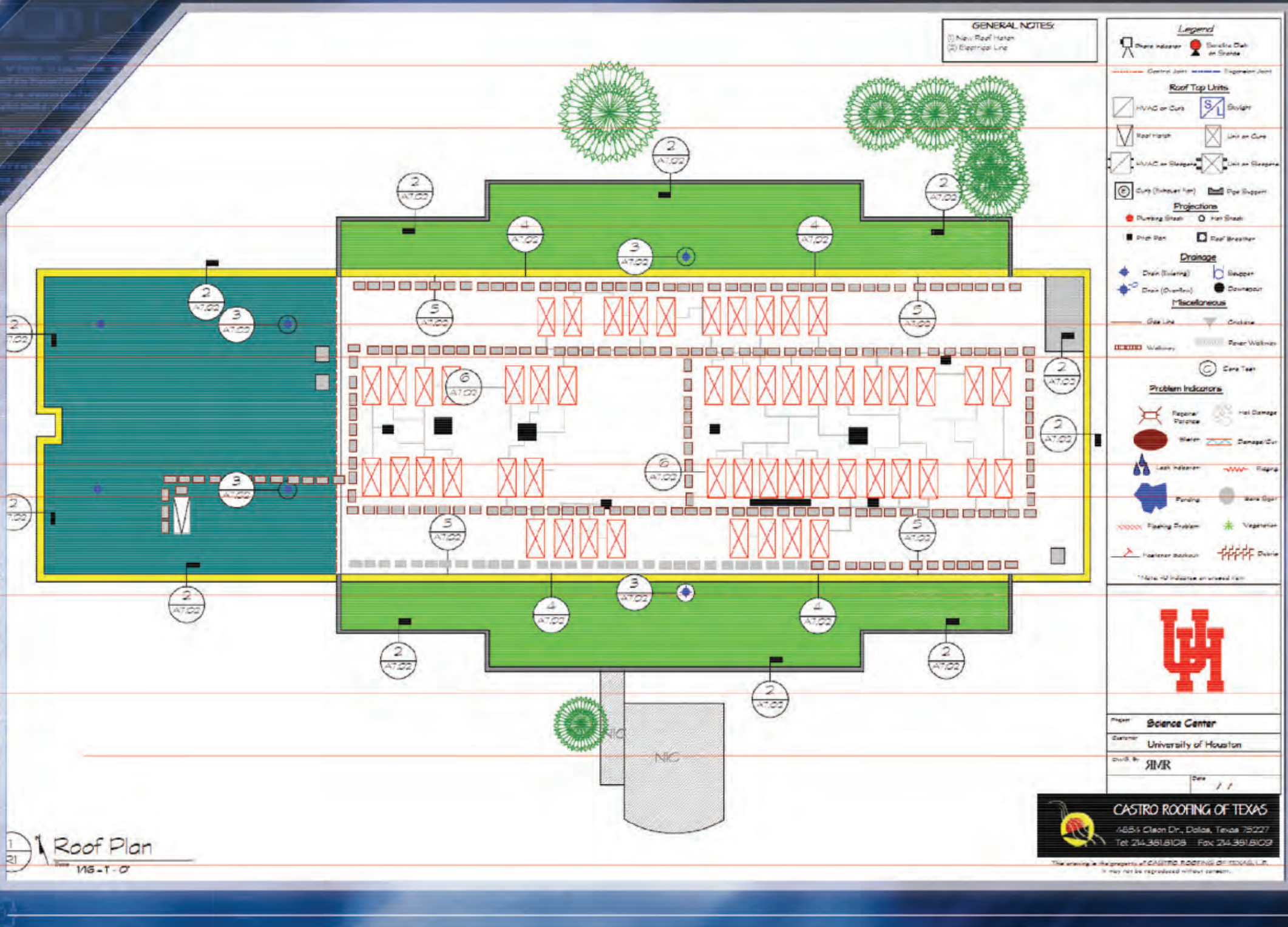
As is always the case with Castro Roofing, our number one concern is for the safety of everyone involved on the project. Ensuring accident prevention was at the forefront of our every thought and action we had over the 22 safety meetings concerning the Science Center building project, during our 63-day construction period.

SAFETY

Our fully staffed Safety Team consists of Castro Roofing's "OSHA 500 HR" Safety Director, who coordinates all safety procedures through our "OSHA 30 HR" Superintendents, and our "OSHA 10 HR" Foremen and Leadmen.

We can proudly report that NO accidents or injuries occurred during the entire length of time that Castro Roofing worked on the Science Center project.

ROOF-PLAN


GENERAL NOTES:
(1) New Roof Hatch
(2) Electrical Line
Legend
Roof Top Units
HVAC or Curb
Skylight
Roof Hatch
Unit on Curb
Projections
Drainage
Miscellaneous
Problem Indicators
NIC
NIC
Roof Plan
1/16" = 1'-0"
Project: Science Center
Owner: University of Houston
Drawn By: RMR
Date: / /
CASTRO ROOFING OF TEXAS
4884 Claim Dr., Dallas, Texas 75227
Tel 214.381.8108 Fax 214.381.8109

TESTIMONIALS

GAF MATERIALS CORPORATION

"Quality You Can Trust Since 1886…From North America's Largest Roofing Manufacturer"

Contractor Services
1361 Alps Road, Bldg.11-2,
Wayne, NJ 07470
Phone: 1-800-766-3411, option 1

December 15, 2010

Mr. Fernando Posada
Castro Roofing of Texas, LP
4854 Olson Drive
Dallas, TX 75227

Email: Fernando@castroroofing.com

Project: University of Houston Science Center

Dear Mr. Posada:

Castro Roofing of Texas, LP of Dallas, TX is a GAF Materials Corporation (GAF) Master roofing contractor for asphaltic, single ply and restoration roofing systems and is eligible to obtain a GAF Diamond Pledge™ (NDL) guarantee for up to 20 years.

In addition, Castro Roofing of Texas, LP earned a score of 9 out of 10 for their quality of installation on the University of Houston Science Center project.

If you have any further questions, please contact us at 800-766-3411. Thank you for choosing a GAF roofing system.

Sincerely,

Jane Lampman

Jane Lampman
Sr. Contractor Services Representative

December 16, 2010

Mr. Rudy Rodriquez
Castro Roofing
4854 Olson Drive
Dallas, TX 75227

ARMKO INDUSTRIES, INC.
1320 SPINKS ROAD
FLOWER MOUND, TX 75028
972.874.1388 / FAX 972.874.1391
www.armko.com

Re: University of Houston Science Center

Dear Mr. Rodriquez:

Please accept this letter of recommendation in regards to the working relationship between Castro Roofing and Armko Industries, Inc. Recently both companies had the opportunity to work together on the re-roofing project for The University of Houston Science Center.

As you well know, Armko's relationship is with the Owner acting as their agent on such projects. Our obligation is to provide specifications and details for the explicit conditions and issues to be resolved per the current codes and requirements. Armko is responsible for the development of the plans and specifications, contractor evaluation, oversight, and quality control of the roofing and/or waterproofing replacements of this type of project.

Because of the nature of the serious complexities of the University of Houston Science Center, and the continual occupancy of the facility, there were many issues that could have quickly made the project become impaired and dramatically weakened had the contractor not attended to the project at hand. With neglect there could have been project altering issues, which would have caused the University to have major down time issues. With the successful removal and installation by Castro Roofing, the outcome for the client was a successful undertaking. The client was fortunate to have Castro Roofing as the contractor for this project.

With the complexity of this project, it would have been detrimental for the client had the facility needed to be evacuated or shut down due to negligence of a contractor; this was not the case with Castro Roofing.

We have been in the roofing industry as consultants since 1983 with a broad experience in the industry and find that many contractors do not pay attention to the project as Castro Roofing did. Many times we find ourselves working with a roofing organization that gives a less than desirable result. Castro's level of expertise and qualifications were outstanding, and with that I say thank you for a job well done.

Your team's insight and ability to understand and collaborate with Armko and the Owner ensured that any unforeseen issues resulted in resolutions not problems, and was a tremendous help. Your company delivered a more quality and timely result to the Client than was originally expected.

We look forward to the next project with Castro Roofing and trust that this level of expertise will be taken to those future projects.

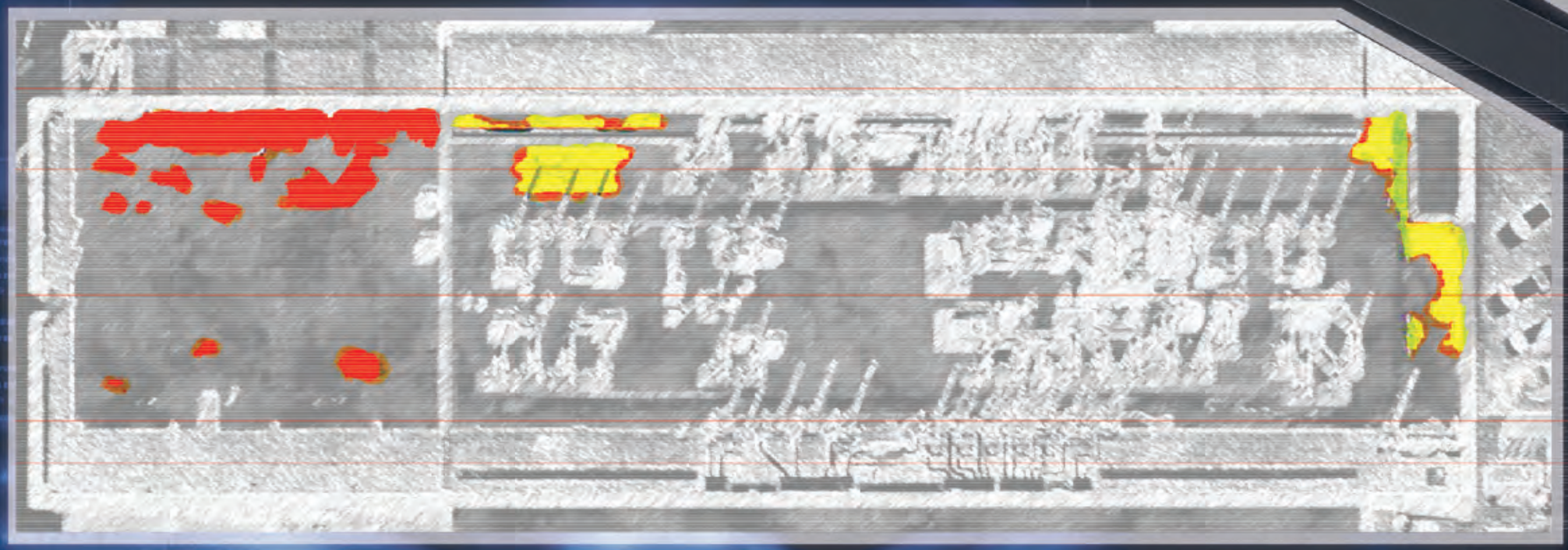
Armko would recommend Castro Roofing as an asset to any Owner's portfolio of contractors.

Sincerely,

Mike Perry

Mike Perry
Building Envelope Consultant

MP/vb



X-VISION

How do you prepare for a natural disaster? When Hurricane Ike struck Texas, the University of Houston was ready and eventually received $26.3M for both obvious physical damage and hidden moisture damage as a result of the storm.

Hurricane Ike was the third costliest hurricane to ever make landfall in the U.S., taking a backseat only to Katrina and Andrew. Just a Category 2 hurricane when it made landfall in Galveston, TX, in September 2008, Ike's maximum sustained winds were 145 mph and the torrential downpour was 8 to 13 inches. Hurricane Ike unleashed $29.6 B in damages region wide.

Dale Irvin, associate vice-chancellor at the University of Houston (UH), was one of a large UH team who was on-site when the hurricane's eye crossed over his campus.

UH's first run-through of physical inspection revealed minimal damage; three roofs ripped off and three roofs with sectional damage. "We were cautiously optimistic and relieved that even though the hurricane eye passed, the damage was not that significant and perhaps less than $4,000,000," said Irvin.

ARMKO's Mike Perry convinced UH that in addition to a physical inspection, a look inside the roofs was vital to determine the scope of moisture infiltration from wind-driven rain. The UH team embarked on a walkover of all roofs, performing a hand-held survey. The walkover infrared survey confirmed the preliminary assessment of minimal damage. Irvin and Perry relayed they had little confidence in these results. Perry recommended for this task a materials testing company with a patented process that could see moisture inside the roof not visible to the human eye.

Before:

$4 million

After:

$26 million

The infrared thermal mapping discovered "30 roofs had such extensive moisture infiltration they all needed to be replaced" said Irvin. "Because of our experience with prior storms and buildings that were obviously damaged, we initially underestimated the possibility that the damage was not visible. Because we had previously restored many buildings to hurricane standards and current building code, in retrospect it was reasonable to expect that the buildings would show less obvious damage because of remediation and structural improvements". Had UH not contracted for the infrared thermal mapping, however, "we would have replaced or repaired a half dozen roofs. And then a couple of years down the road, it would be too late to go back to FEMA, our insurance company, or the State to enable restoration," Irvin observed.

"You need pre and post baseline assessments to know exactly where you stand before a catastrophy and it is simple to manage your building inventory... The awards would have been even greater with a pre and post survey."

Jen McPherson, MARSH/FAC, Forensic CPA.
The Results of Preparation: A $26.3M Refund

These are the NTRCA members:

Spec Building Materials Corporation

Roofing Supply Group LLC

Shelter Distribution

ABC Supply Company

GAF Material Corporation

Armko Industries, Inc

MEMBER INVOLVEMENT

STORM HAWKS

CASTRO
ROOFING