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# THE PARKING STRUCTURE PROTOTYPE I

Prepared by: AISC Steel Solutions Center

## What's this?

This package contains a fictitious project with an imaginary client. It illustrates the type of information that the AISC Steel Solutions Center (SSC) typically receives and the Conceptual Solution that might be prepared in reply. It is important to note that the information comes with the continued involvement of the Steel Solutions Center and more directly AISC's Regional Engineers. Together, we are committed to developing efficient, economical solutions in steel and providing continuous support for the life of the project.

## Incoming:

A project can find its way to the Steel Solutions Center a number of ways. Common scenarios include:

1. AISC may hear about the project while visiting an architect or engineer's office and cold-call the developer to find out more.
2. A general contractor is asked to provide budget numbers for a project designed in concrete. They see an opportunity to save money using a steel frame and take the project to their favorite fabricator. The fabricator agrees to put together a steel alternate and calls the SSC for help.

## The Solution:

The AISC team and the client work together—often via conference call—to determine what can be done to move the project forward in steel. The Steel Solutions Center can provide a wide range of solutions from a simple bay study to a lateral system analysis, foundation comparison and conceptual estimate. A unique Conceptual Solution matching the detail of this prototype would represent the SSC's highest level of response.

## What now?

The Prototype is one example of the Conceptual Solutions the SSC can provide. More importantly, because it is representative of many real steel parking structures, it can be the first step in moving the project forward in steel. Many SSC clients have found this Prototype alone can capture the developer's attention.

The Steel Solutions Center has been involved in a broad range of projects since our inception in 2001. In addition to parking structures, we can help you find innovative solutions for high-rise offices, multi-story residential buildings and more.

It is important to us to meet the expectations of the people we work with. The last two pages communicate what our clients can expect from the Steel Solutions Center and what the SSC expects from our clients. Remember the Conceptual Solution is only the beginning. The AISC team will continue to provide assistance for the life of your project.

*Please let us know how we can assist you with your next project.*



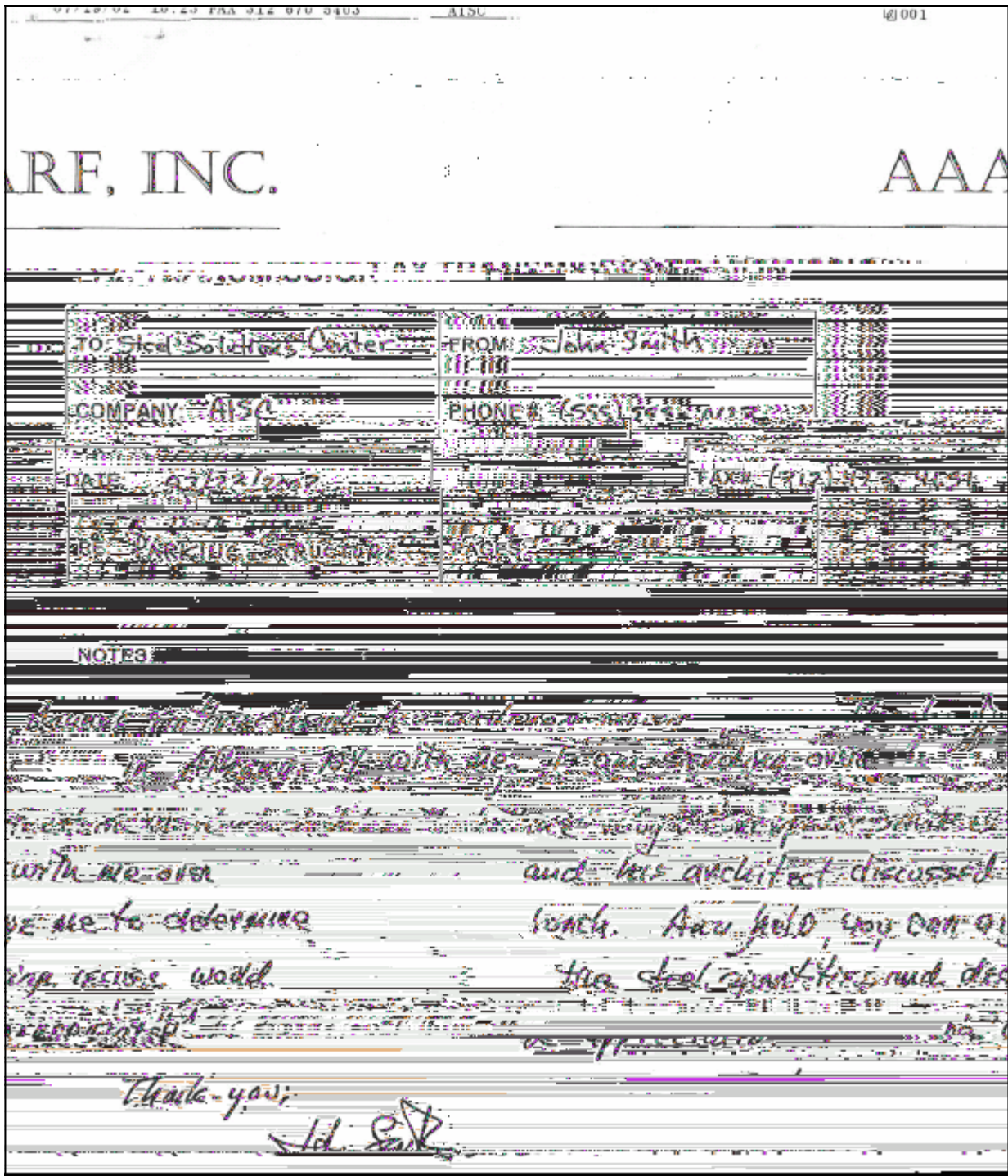
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# The incoming fax...

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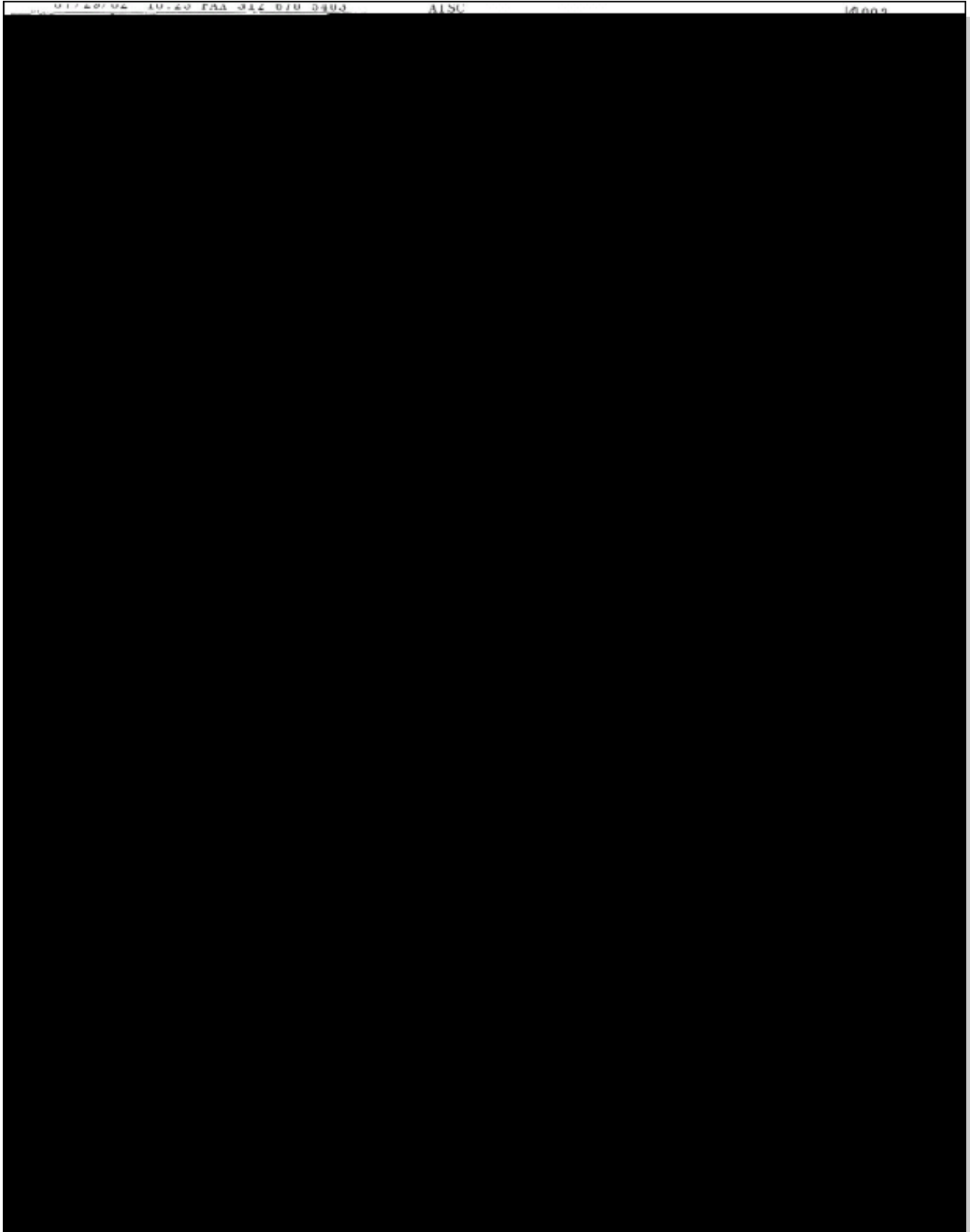
## Incoming:

John Smith saw a Steel Solutions Center ad in Modern Steel Construction and sent an e-mail to the SSC. Gene Martin, the Regional Engineer for the Upper Midwest, contacted John to discuss the project that afternoon. As a result of the conversation John sent a fax to the SSC, which is included in the next two pages.



# The incoming fax...

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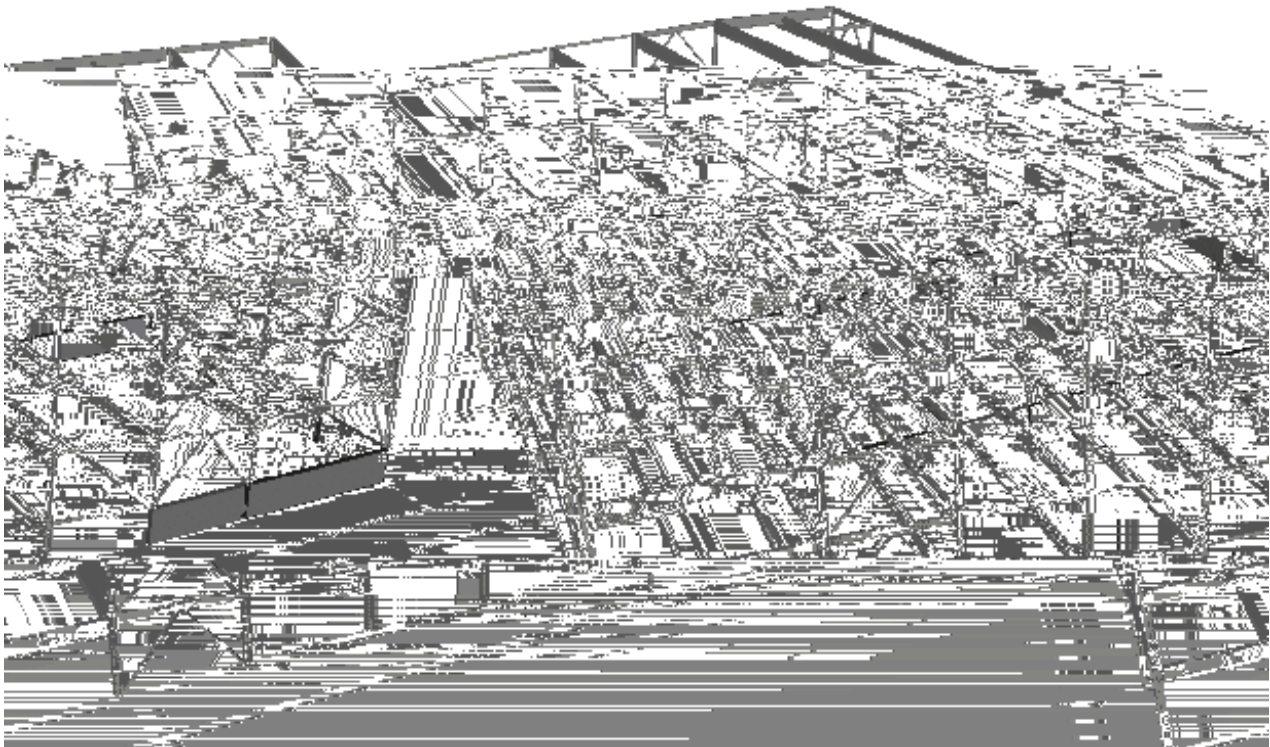




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# THE PARKING STRUCTURE PROTOTYPE I

SSC Advisor: Jason Ericksen  
Regional Engineer: Gene Martin  
Date: July 30, 2002



## **This Package includes:**

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Comments on the Provided Solution

Steel Quantity Takeoff

Design Loads and Parameters

Typical Floor Framing Plans

Gravity Columns

Braced Frame Elevations

Fireproofing Evaluation

North Levels

South Levels

Layout

Schedule

Frames #1 and #2

Frames #3 and #4



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# COMMENTS ON PROVIDED SOLUTION

866.ask.aisc ■ solutions@aisc.org

Project: Parking Structure Prototype I  
Location: Albany, NY  
Client: AAARF, Inc.

Date: July 30, 2002  
SSC Advisor: Jason R. Ericksen  
Client Contact: John Smith

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# QUANTITY TAKEOFF SHEET: Post-Tensioned Slab on Steel

Project: **Parking Structure Prototype I**  
Location: **Albany, NY**  
Client: **AAARF, Inc.**

Date: **July 30, 2002**  
SSC Advisor: **Jason R. Ericksen**  
Client Contact: **John Smith**

## Slab-on-Grade:

12,840 ft<sup>2</sup> Parking (36 spaces)

## Suspended Floor Areas:

89,955 ft<sup>2</sup> (89,950 ft<sup>2</sup> of parking with 255 spaces)

## Steel Quantities:

Gravity Columns





Project: **Parking Structure Prototype I**

Location: **Albany, NY**

Client: **AAARF, Inc.**

Date:

**July 30, 2002**

SSC Advisor:

**Jason R. Ericksen**

Client Contact:

**John Smith**



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# FIREPROOFING ISSUES: NFPA and IBC 2000

Project: **Parking Structure Prototype I**

Location: **Albany, NY**

Client: **AAARF, Inc.**

Date:

**July 30, 2002**

SSC Advisor:

**Jason R. Ericksen**

Client Contact:

**John Smith**

## Code Applicability:

The year 2000 marked the release of the International Building Code, with an update in 2003, while the National Fire Protection Association 5000 code was released in 2002. Both were created as an attempt to consolidate the multiple model codes designers have been faced with over the past several decades. NFPA 5000 (6.4.2.55) specifies that all types of parking structures conform to NFPA 88A. Verification of which code is applicable for a planned parking structure should take place as planning begins.

## Code Definitions:

Care must be taken in understanding the provisions of the codes based in the definition of certain terms. These include:

*Height*-the IBC defines the height of a parking structure as the vertical distance from the finished ground level to the top of the highest structural member.



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Project: **Parking Structure Prototype I**  
Location: **Albany, NY**  
Client: **AAARF, Inc.**

Date: **July 30, 2002**  
SSC Advisor: **Jason R. Ericksen**  
Client Contact: **John Smith**

## Code Comparison:

	NFPA 88A Type II		IBC Type IIB	
Fire Resistive Requirement	None		None	
Definition of Open Side	1.4 sq ft of each linear foot distributed along 40% of the perimeter		50% of interior wall area of the side	
	sq ft/tier	# of tiers	sq ft/tier	# of tiers
2 sides open	unlimited <sup>1</sup>	height <= 75 ft	50,000	8
3 sides open	unlimited <sup>1</sup>	height <= 75 ft	62,500	9
4 sides open	unlimited <sup>1</sup>	height <= 75 ft	75,000	9
Exception <sup>1</sup>			unlimited <sup>1</sup>	height <= 75 ft

<sup>1</sup>The distance from any point on the deck may not be greater than 200 ft from an open side.

## Subject Project:

An open deck parking structure with four open sides (as defined under both NFPA and IBC) consisting of grade level parking and five supported levels of deck (tiers). The footprint of the garage is 160 ft by 120 ft or 19,200 sq ft per tier. The structure height is 56 ft.

## Code Application:

Under both NFPA and IBC the structure falls under the 75 ft exception with all points on any deck within 200 ft of an exterior opening allowing unlimited deck area with a NFPA Type II (000) or IBC Type IIB classification. There is no fire resistive requirement for this project.



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