



# **THE BUBBLE SHOVEL™**

## **PROTOTYPE DEVELOPMENT PACKAGE**

C O N F I D E N T I A L  
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# PRESENTATION OUTLINE



- Selection of Leading Concept
- Review of Specifications
- Scale Drawings
- 3-Dimensional Computer-Aided-Design Models
- Rapid Prototype Mock-up
- Conclusions and Recommendations

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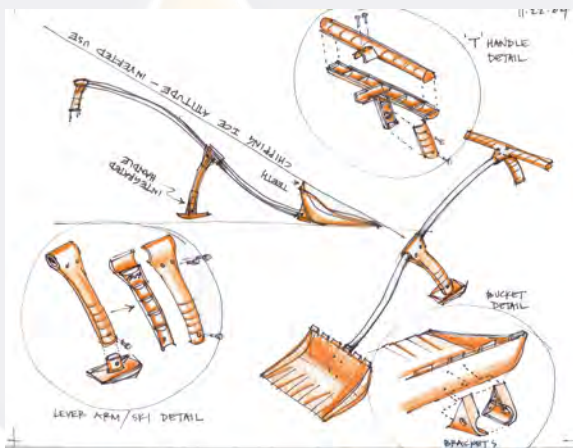
# CONCEPT SELECTION MATRIX



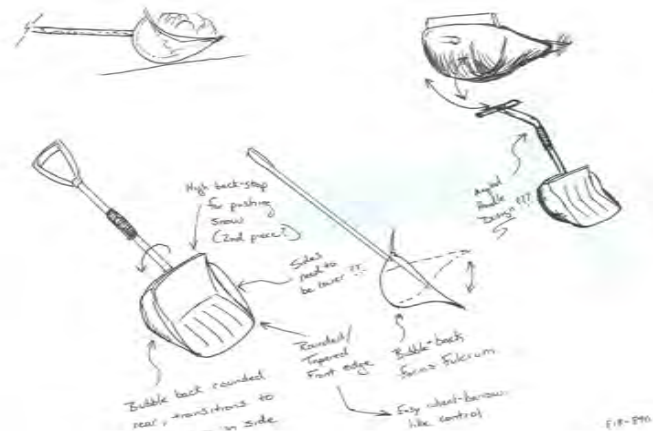
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	Ease-of-Use	Ability to Lift Snow	Ability to Transport Snow	Ability to Push Snow	Ability to Dump Snow	Design Complexity	Est. Cost	Patentability	Total Score
<b>Ski Fulcrum</b>	9	9	6	6	6	3	3	6	48
<b>Shovel Head Fulcrum</b>	9	6	9	6	6	9	6	6	57

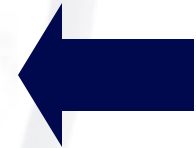
Scale 1,3,6,9  
9 being the best



**Ski Fulcrum**



**Shovel Head Fulcrum**



**Shovel Head Fulcrum Concept Selected for Continued Development**

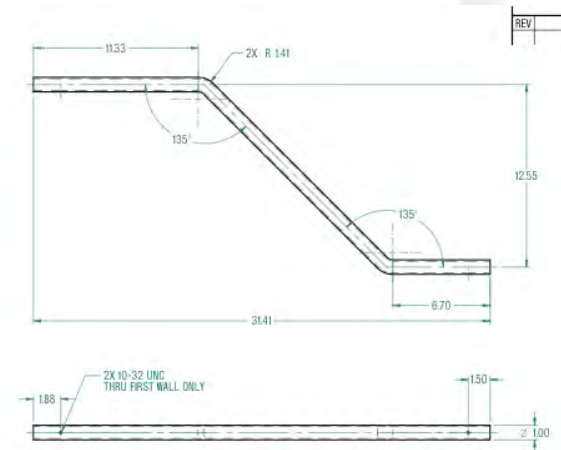
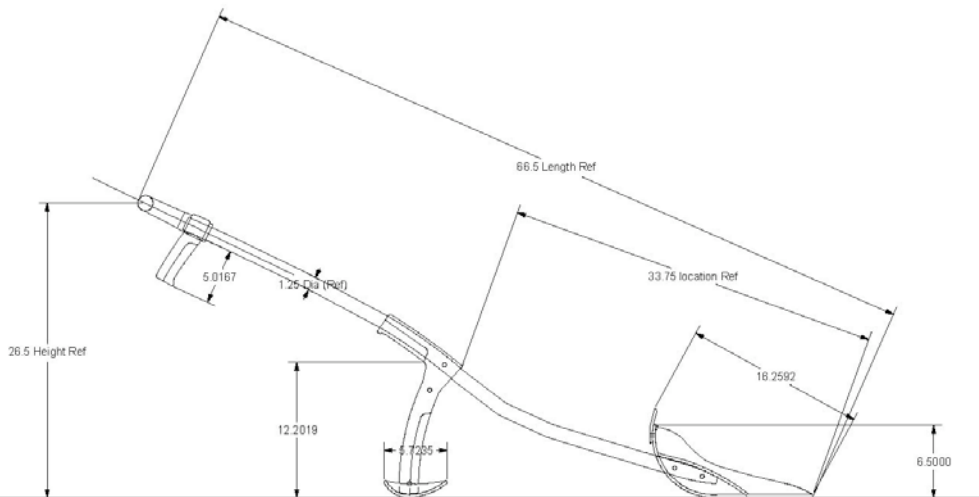
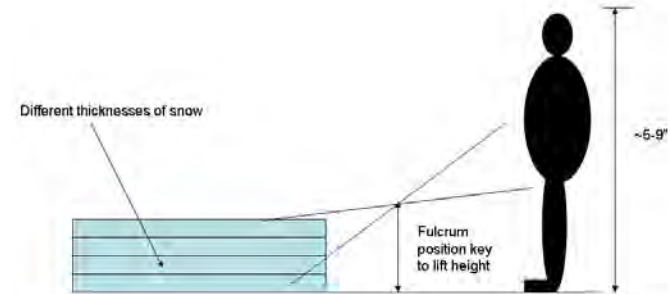
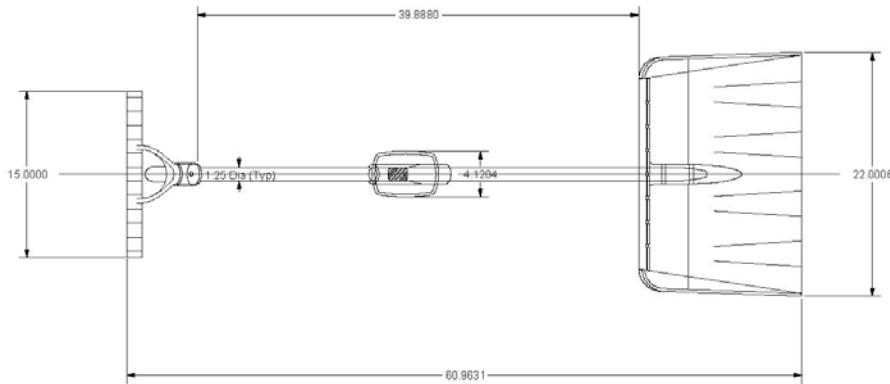
# REVIEW OF SPECIFICATIONS



- Ability to easily push, lift, transport, and dump snow
- Ability to be used like a standard snow shovel
- Ability to reduce muscle and cardiovascular strain
- Ability to be patented, both Design and Utility
- Ability to be manufactured using conventional materials and methods
- Ability to be sold in conventional retail outlets
- Retail MSRP to be less than \$30.00 USD

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# SCALE DRAWINGS

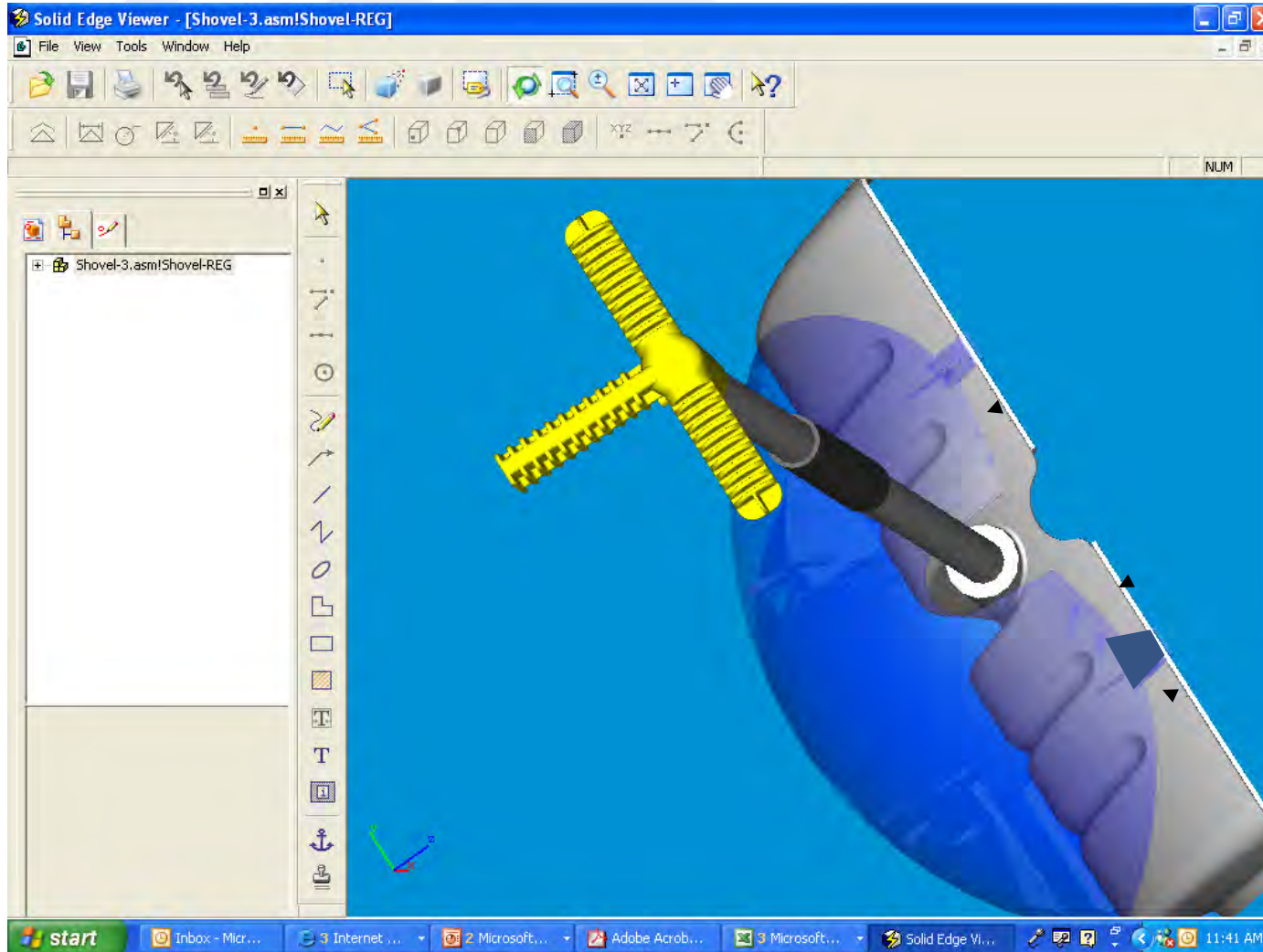


**Scale drawings can be useful to layout 3D CAD, or have custom components fabricated like the shovel shaft**

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C O N F I D E N T I A L

# 3D COMPUTER-AIDED-DESIGN

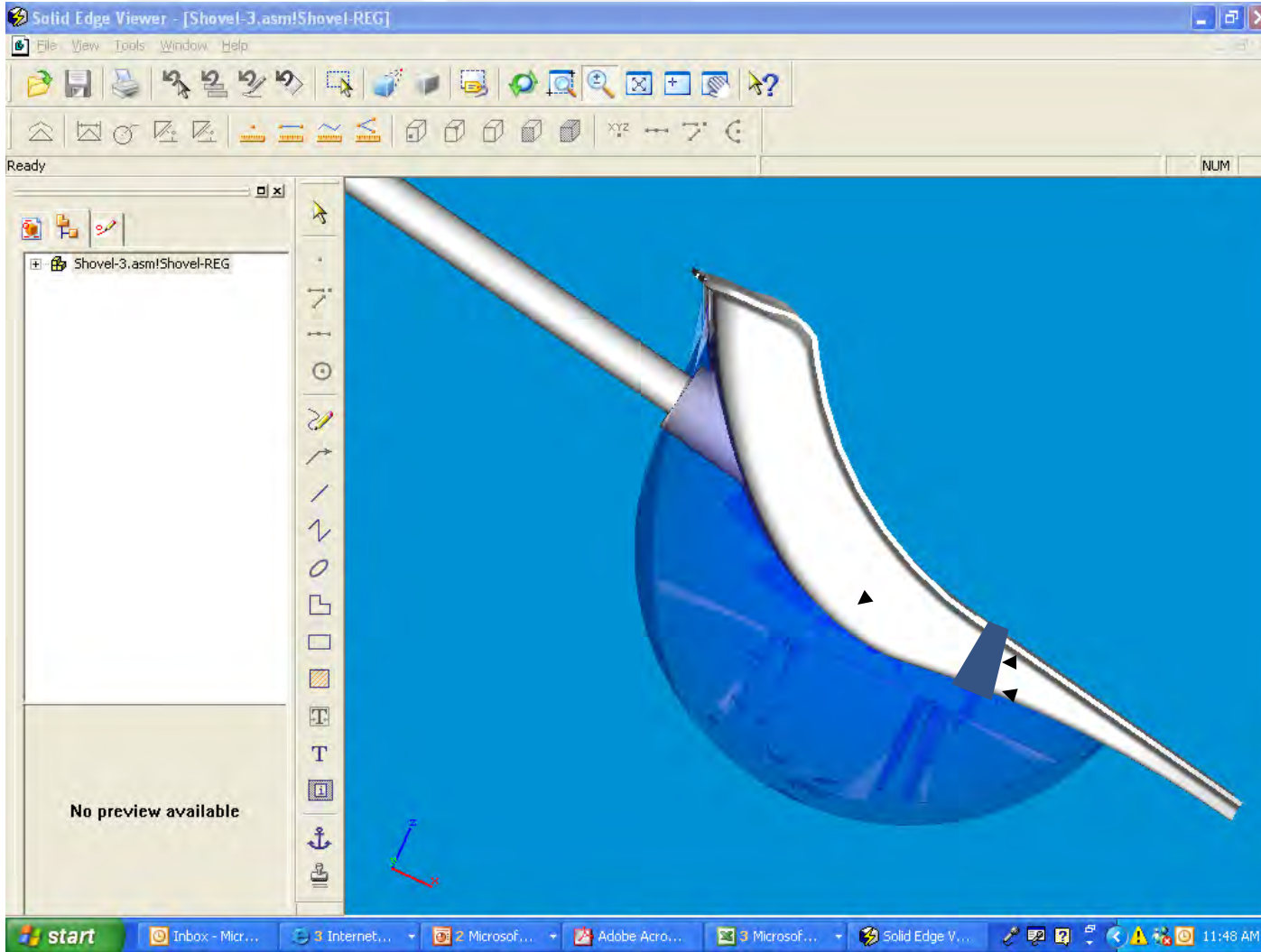


**A features (ribs/'retaining features') on the shovel head to locate and impeded rearward movement of the Bubble**

**Taper snaps (wider near bubble) and round base corners, removing stress risers**

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# 3D COMPUTER-AIDED-DESIGN

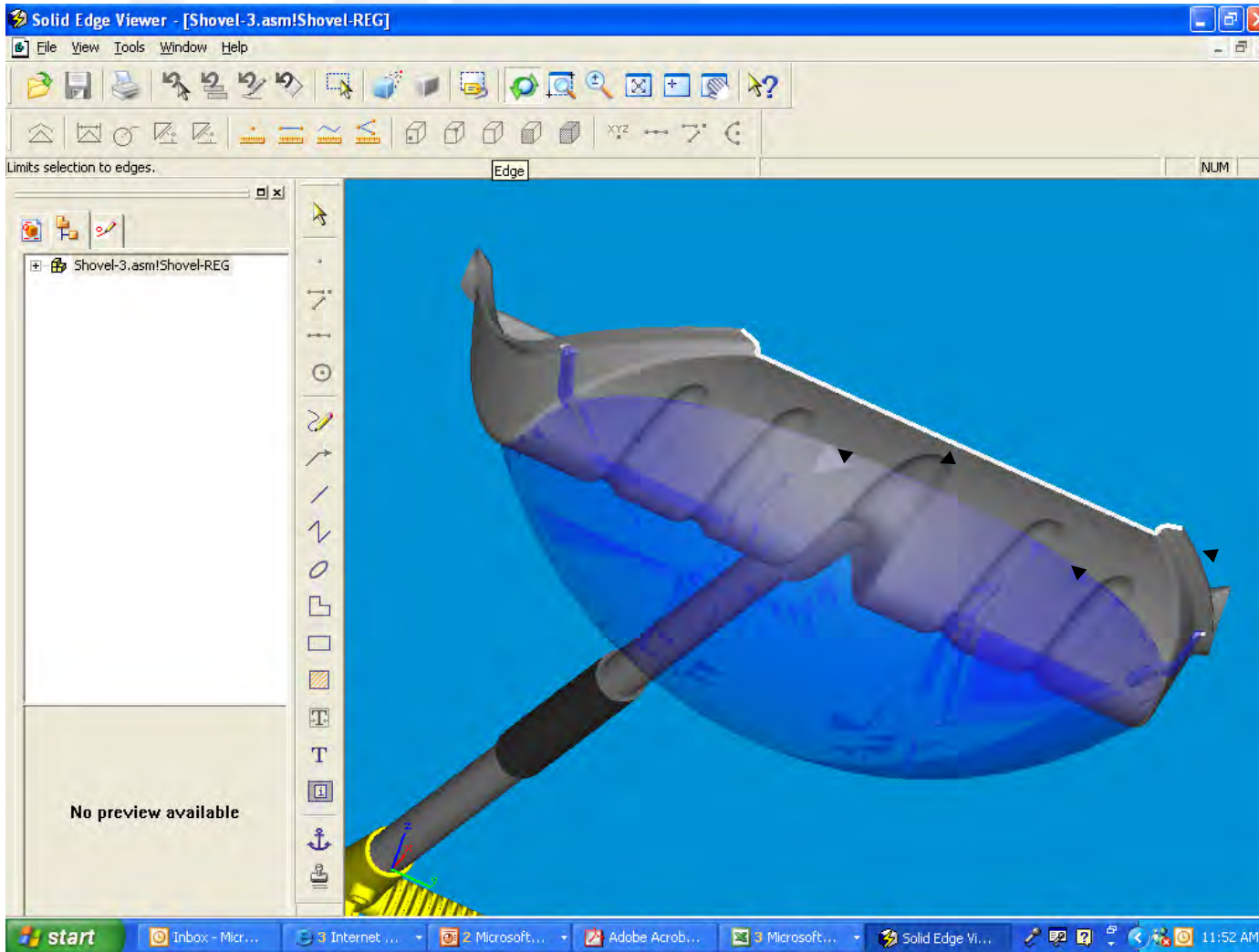


**A features (rib/'retaining feature') on the shovel head to locate and impeded lateral movement of the Bubble**

**Enlarge and taper side snaps (wider near bubble) and round base corners, removing stress risers**

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# 3D COMPUTER-AIDED-DESIGN



**A features (rib/'retaining feature') on the shovel head to locate and impeded forward movement of the Bubble**

**Taper side wall smoothly into shovel front**

**Add small snaps from bubble into shovel head**

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# RAPID PROTOTYPE AND TESTING



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**3-D CAD and Scale Drawings used to make look and function prototype**

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# RECOMMENDATIONS



- Design and testing phases went well
- The handle height needs to be raised/lengthened to maximize mechanical advantage during lifting
- We recommend slight improvements to the design to aid in structural integrity
- Stainless steel blade should be added to the front shovel head tip
- Rear grip needs to be revised for ergonomics

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