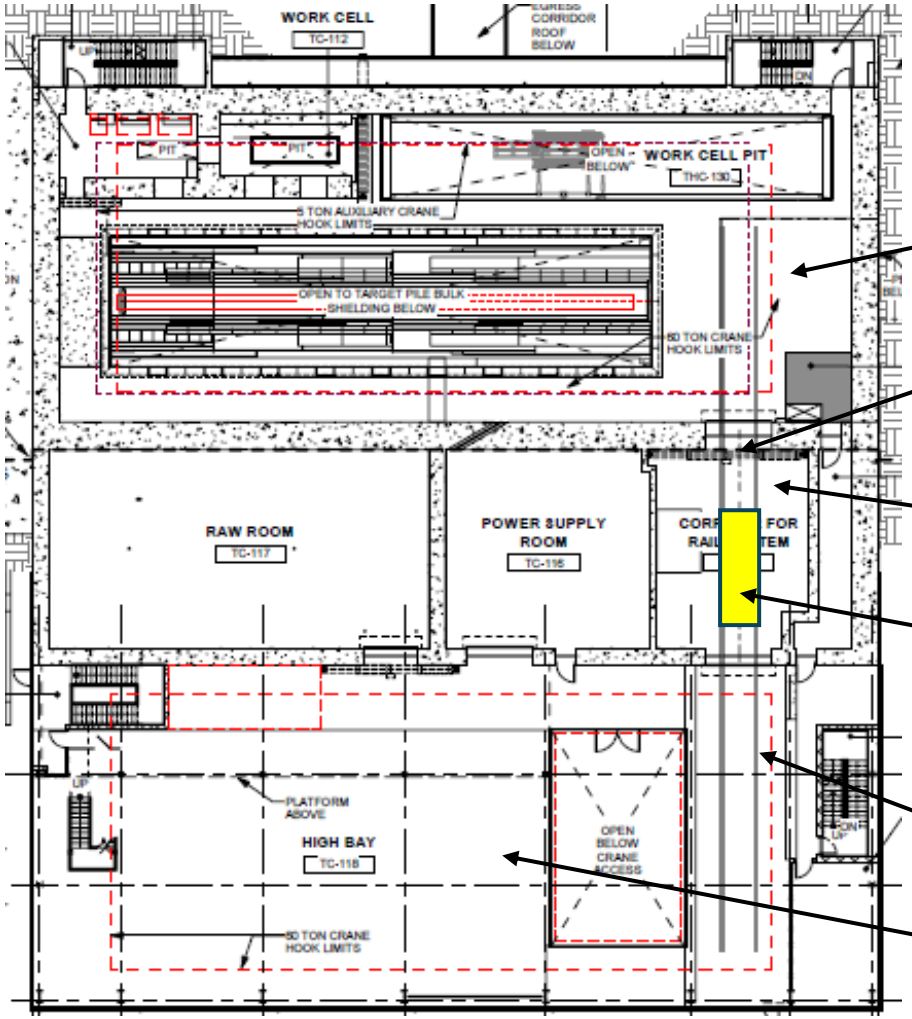
LBNF Transfer Cart possible solutions and power supply location

Vladimir Sidorov

June 5, 2024

Target Hall



Target Hall

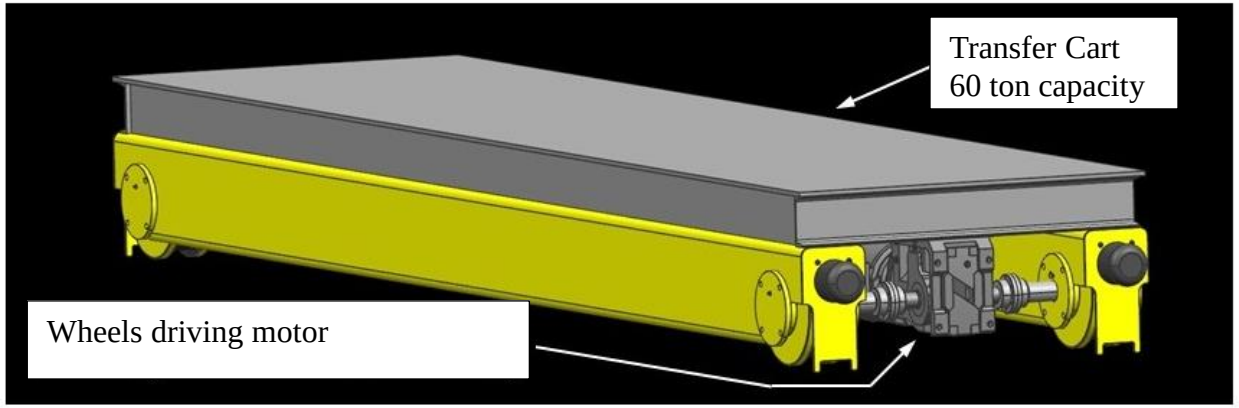
Main Entrance door

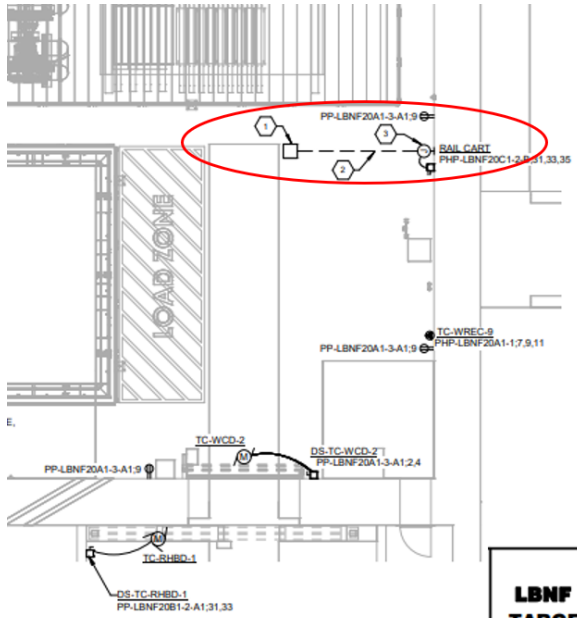
Corridor

Transfer Cart

Rails

Service Building





E-TC-109 KEYNOTES

KEYNOTE	DESCRIPTION
1	PROVIDE REMOVABLE COVER SUITABLE FOR INSTALLATION ADJACENT CONCRETE SURFACES. COVER TO BE SUITABLE TO WALK ON AND HAVE EITHER PENETRATIONS OR REMOVABLE PORTIONS TO ALLOW FOR CONDUCTORS TO BE ROUTED THROUGH THE COVER.
2	PROVIDE ONE (1) 4" RMC IN SLAB FOR RAIL CART POWER FROM HAND HOLE, THEN UP IN WALL TO WALL MOUNTED JUNCTION BOX
3	JUNCTION BOX FOR RAIL CART POWER. MOUNT BOTTOM OF JUNCTION BOX 1' - 0" AFF.

PROJECT NO. 6-15-11
LBNF NEAR SITE CONVENTIONAL FACILITIES
TARGET COMPLEX - MAIN LEVEL POWER PLAN - NORTH

DRAWING NO. **E-TC-109** REV. 01

10/13/23

HOOSIER CRANE
SERVICE COMPANY
3500 Charlotte Ave Elkhart, IN 46517
Phone: (574) 523-2945 Fax: (574) 523-2916
Email: sales@hoosiercrane.com
WWW.HOOSIERCRANE.COM
24 HOUR EMERGENCY SERVICE

Customer Quotation

Attention:
ROBERT MAGINOT

Date	Quotation #
12/17/2019	E086164-19
Cust Ref No.	
POWER TRANSFER CAR	

Name/Address

apinvoices @fnal.gov
FERMILAB
Accounts Payable
P.O. Box 500
Batavia IL 60510-5011

Ship To

Marcel Borcean
Fermilab Receiving Warehouse
Receiving Warehouse 2
Kirk Rd. & Wilson St.
Batavia IL 60510

Invoice Terms	Lead Time	Valid Until	Sales Rep	Shipment Terms
30% down, 60%	12-18 Weeks	3/6/2020	Ronald A Ippolito	Prepaid and Allowed

Item Number	Qty	Description	Rate	Amount
Description		BUDGETARY PRICING FOR A POWER TRANSFER CART PER DRAWING PROVIDED		
Project Terms		Project Invoice Terms: 30% Down Payment Due with Receipt of Purchase Order 60% Payment Due Prior to Product Shipment 10% Payment Due Net 30 Days After Project Completion. Freight: Project Estimated Freight Included Tax: Not included in the Project Estimate		
1001-060T	1	Custom Transfer Cart Per Print & Specifications Supplied: Capacity: 60-Ton Span: 6 Ft - 0 Inch Voltage: 460 VAC - 3 Phase - 60 HZ Bridge Speed: 80 FPM VFD (2 Speed Control) End-Truck Mfg: IMS Wheel Diameter: 15", 400 BHN Wheel Base: 200" MWL: 37k Motors: Qty 2 @ 2-HP, Helical bevel reducers mounted horizontally End-Truck Wheels Designed to fit 60# ASCE Rail FEATURES *Factory Painted Safety Yellow *Factory Assembled and Tested *Control Panel with Rod Disconnect, Mainline Contactor, Control	62,873.00	62,873.00

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Customer Quotation

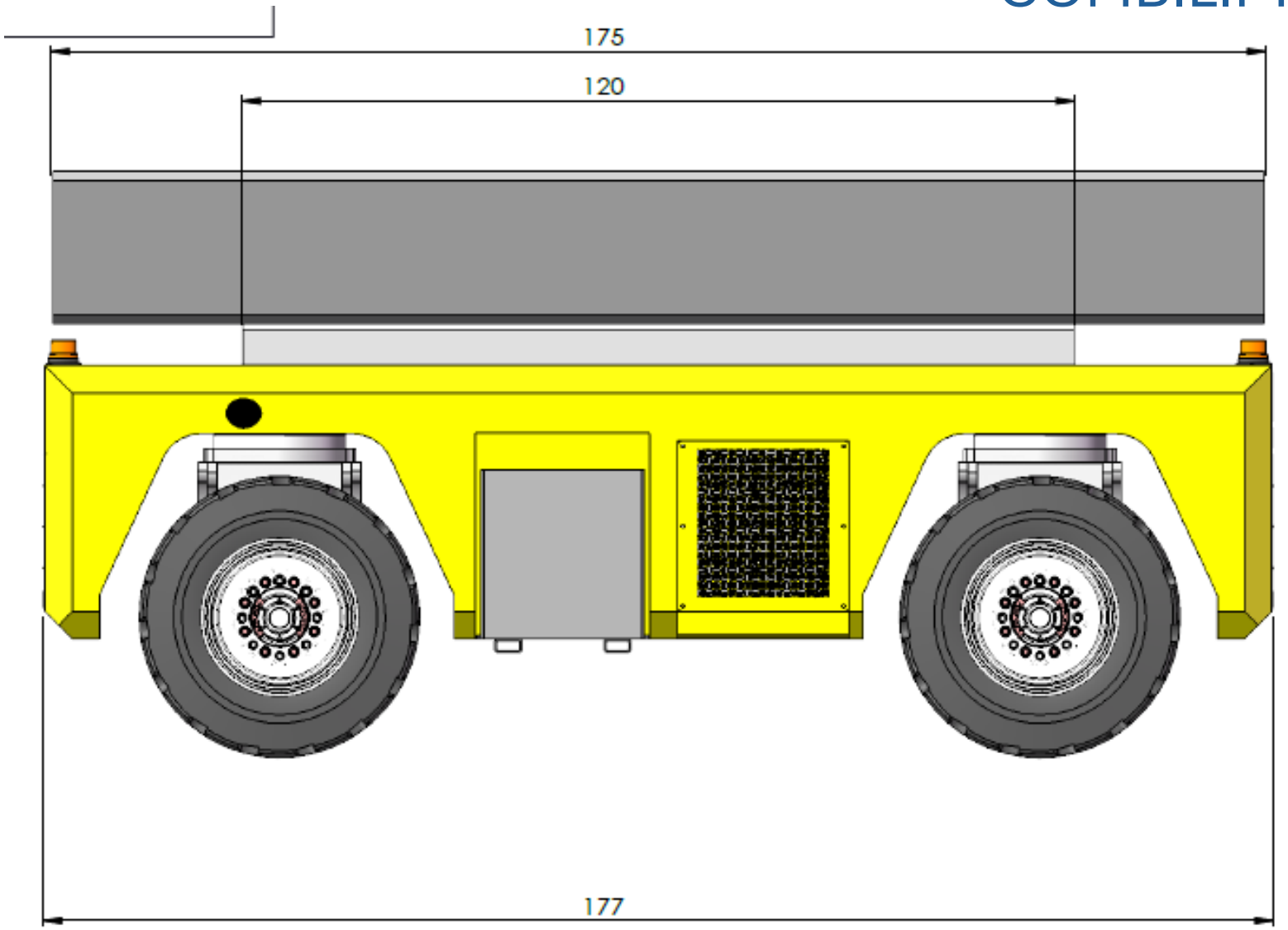
Attention:
ROBERT MAGINOT

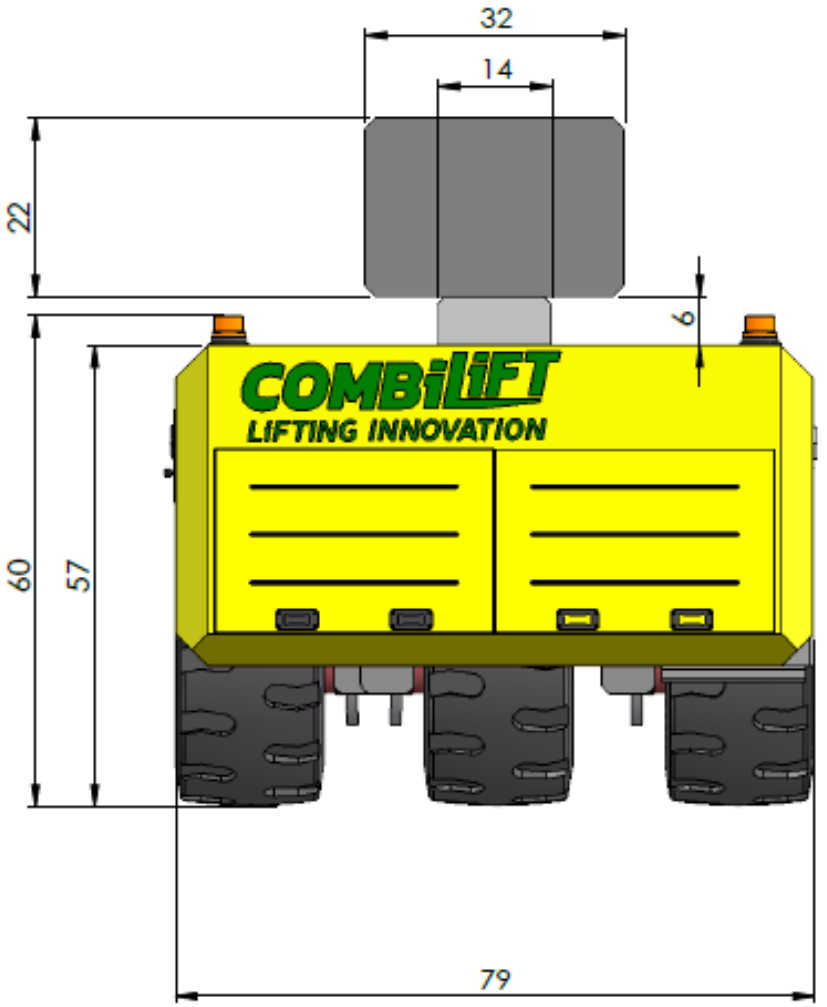
Date	Quotation #
12/17/2019	E086164-19

Item Number	Qty	Description	Rate	Amount
		result in additional charges. -Load Testing is not included in the above proposal. If load testing is required it will be additional cost on a time and materials basis. -Due to the current unstable steel pricing, any quotation will be subject to pricing review/change after 48 hours. Orders where shipment will be more than 30 days from date of order are subject to a pricing review/change as well. -Exceptions to these bid notes to be agreed upon in advance in writing with Hoosier Crane.		

Subtotal	62,873.00
Shipping Cost (Freight)	5,000.00
Total	$67,873.00

COMBILIFT





HUBTEXT

Rail-mounted trucks

The rail-mounted trucks (GW) made by HUBTEX are tailor-made to suit individual customer wishes and requirements. Well-proven standard components are used in the driving mechanisms and the control systems. The rail-mounted truck is exclusively designed for in-plant transport.

- Load and/or towing vehicle
- Load capacities up to 350 t
- Indoor and out-door application

- Durable crane running wheels
- Cable or radio remote control
- Robust design
- Load-specific load bearing
- Battery or mains operation
- Maintenance-free AC drive technology
- Individual frame design
  depending on the transport task

Operation variants

Radio and cable remote control

The radio remote control is equipped with joysticks for precise control, emergency-stop, horn buttons and other options. Alternatively, a cable remote control is also available. This can be connected to the vehicle using several sockets.

Cabin/driver's station

Besides the pedestrian-controlled variants, solutions are also available with a driver's seat and a driver's station.

Type	SFB	GW
Load capacity (t)	up to 100.0	up to 350.0
Drive (V)	24 / 80 / 230 / 400 (electric AC)	
Tyres	EL / PU / pneumatic / rail wheels	
Operation	Cabin / remote control / driver's station	

Options

- Working headlights
- Four-chamber lights
- Flashing lights
- All-round lights
- Acoustic driving alarm
- Contact strips
- Bumpers
- Laser scanner

Safety

- Emergency-stop buttons on all sides
- Protection bars on the front sides
- Optional personal protection system using laser scanners

COMBILIFT

ESTIMATING INQUIRY FORM

Fermilab – LBNF Project – supply Transport & Transfer Vehicle

A. Company Name : Combilift LTD.
Contact Name : Jeffrey Saxman (630) 270-0070
Budget per exhibit A and exhibit B Yes

B See attached proposal , Clarifications and assumptions
ATTACHED

C Requested Trade Break down per below :
1) Unit as offered based on scope of work described
$ 470,000.00

2) Quality Assurance Provisions per technical specification
$ 25,000.00

3) Tests per technical Specification
$ 20,000.00

4) Delivery , Installation and Commissioning (Destination) per line items (Paragraphs specified)
$ 30,000.00

Analysis and Documentation per technical specification .
$ 50,000.00

TOTAL BUDGET AMOUNT ……. $ 595,000.00

D. Work to be performed in 300 days after NTP

E Addenda Acknowledged Yes
Cost savings suggestions : NO

Title : Vice President Sales
E-Mail Address : Jeffrey.saxman@combilift.com
Date : August 20, 2019

G. Submitted By :

HUBTEXT

July 22, 2019

ESTIMATING INQUIRY FORM

Fermilab –LBNF Project – Supply Magnet Transport & Transfer Vehicle

Budget Due Date: Friday, 8/19/19 at 2:00 PM CST

E-Mail Inquiry to: Robert Maginot at rmaginot@fnal.gov

A.) Company Name: Design Storage + Handling
Contact Name: Steve Kistner / Paul Scarbore Tel: 540-419-1422 / 540-604-6830
Budget per Exhibits A and Exhibit B Yes X No

B.) Please attach Proposal, Clarifications and Assumptions:

C.) Requested Trade Breakdown per below:

1.) Provider of innovative solutions to meet industry specific material Handling challenges.

Total Budget Amount = $ 650,000.00

D.) Schedule – Work to be performed in 250 days after NTP.

E.) Addenda Acknowledged (if applicable) - #

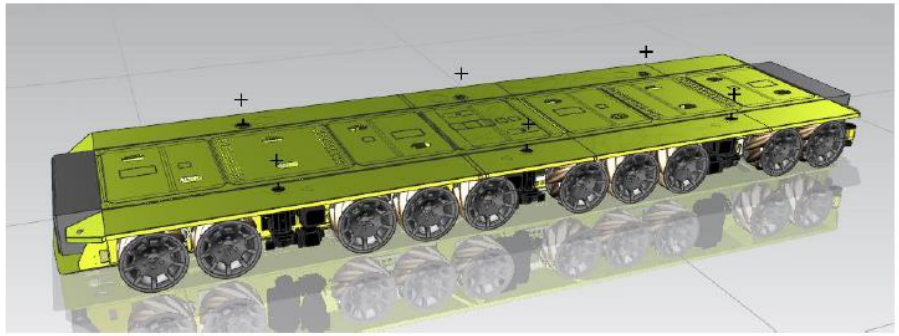
F.) Cost Saving Suggestions (please attach):

Yes No X

G.) Submitted by: Steve Kistner
Title: Business Development Specialist
E-mail address: SKistner@designstorage.com
Date: 8/19/19

omniMove Vehicle Specifications

Basic Concept			
Maximum Payload	25000	kg (daN)	(55,100 lbs)
Empty Weight (approx.)	10000	kg (daN)	(22,000 lbs)
Total number of wheels	20	piece	
Number of driven wheels	16	piece	
Vehicle Dimensions			
Maximum length with laser scanners (+/-10mm)	6500	mm	(255.9 in)
Maximum width with laser scanners (+/-10mm)	2000	mm	(78.7 in)
Vehicle height (stroke=0, without alignment cones)	420	mm	(16.5 inch)
Vehicle height (stroke=max, without alignment cones)	620	mm	(24.4 inch)
Longitudinal distance between payload interfaces	1600	mm	(63.0 inch)
Lateral distance between payload interfaces	1060	mm	(41.7 inch)



ROM Project Scope and Pricing

Robotic Automation System

- **(1) KUKA omniMove KoM UTV-2 E375 per above description**

Total System Price **$1,372,000**

Technical Assumptions, Clarifications and Exceptions

- Tooling and workpiece fixturing is not included in this ROM. Tooling and workpiece fixturing can be provided during firm proposal process once upon receipt of part drawings with GD&T.
- Offering includes (6) electric lifting spindles.
- Autonomous navigation is available but not included as part of this offering.
- Transition between flat floor and slope requires a "smooth" transition. Final "transition specification" can be discussed and reviewed during firm proposal process.

Commercial Terms

- To be defined at time of firm proposal
- Genesis Systems proposal is subject to the negotiation of mutually acceptable terms and conditions by the parties.

Acceptance Criteria

- To be defined prior to firm proposal

Estimated Shipment (after receipt of PO) **36 Weeks**

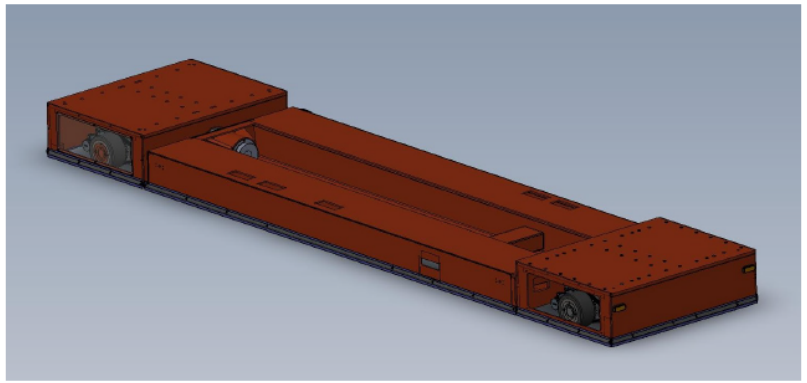
Terms and Conditions of Sale

- https://ipgphotonics.box.com/v/GenesisSystemsSalesTerms

HANDLING SPECIALTY BUDGETARY PROPOSAL NO. 94935

2.2 Equipment Description

2.2.1 Technical Data, Scope of Supply – Item 1



The manually guided vehicle (MGV's) captured in this proposal is equipped with modular traction/steering drives that are bolted to a fabricated steel frame.

The MGV features traditional steering as well as crab steering capabilities. The MGV also features Zero Turn Radius (ZTR) steering which allows the MGV to turn about its center. All of these steering modes are available in both unloaded and loaded conditions offering maximum flexibility of use.

The MGV is equipped with an e-stop button on the corners of the main frame as well as amber strobe lights and audible signal that indicate the MGV is going to start motion and is in motion.

All models are designed to meet the applicable sections of the Industrial Trucks Standards Development Foundation (ITSDF) B56 series standards and follow OSHA guidelines where applicable.

The MGV is designed to be capable of traverse motions on floors with the following specifications:

Edges	¼" abrupt elevation change maximum, smoothed
Debris	Travel path must be free of debris
Expansion Joints	¼" maximum
Grade Rating	0%
Flatness	1% and ¼" variation in 5ft or less
Floor Finish	0.6 coefficient of friction between traction wheels and floor
Static Dissipative	less than 35 MΩ

1.0 SUMMARY OF COMMERCIAL PROPOSAL

1.1 HS Supplied Equipment and Services

Item #	Description	Quantity	Budgetary Price Per Unit	Total Budgetary Price	Currency
1	Manually Guided Vehicle	1	$400,000.00	$400,000.00	US Funds
TOTAL BUDGETARY PRICE (+/-15%)				$400,000.00	US Funds

Please note that the pricing information as presented is budgetary (+/-15%) and is based upon the US-CDN currency exchange rates at the time of proposal submission. Pricing may be subject to revision in the event of fluctuations or changes to that exchange rate at the time of order placement. Pricing is also contingent on upon the receipt of a contract covering the specified quantities as presented in section 1.1.

1.2 Optional Services

1.2.1 Site Assistance

Handling Specialty recommends the purchase of on site assistance to support the installation and commissioning tasks. Experience has proven that interfacing challenges and start up anomalies are best handled by having one of HSML's technical staff on site. Unless presented as a line item in "1.1 HS Supplied Equipment and Services", it is recommended that a separate quotation for on site assistance be obtained. The quote will be based on site conditions, operating procedures, supplied equipment, utilities, peripheral equipment and customer supplied technicians

1.2.2 Field Service

All field services offered by HSML, not included in this base proposal, will be provided at the published rates in effect when the service is performed.

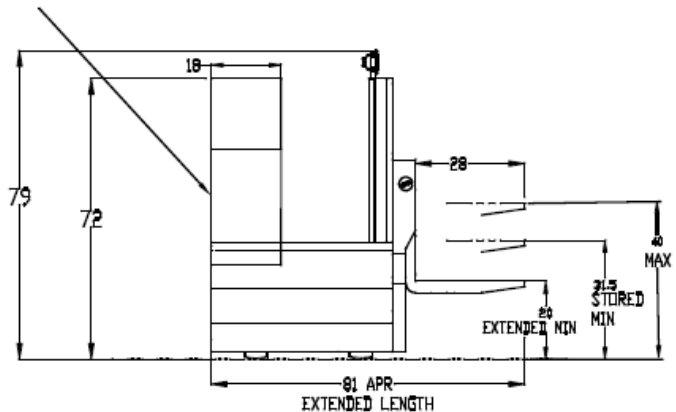
1.2.3 Additional Service

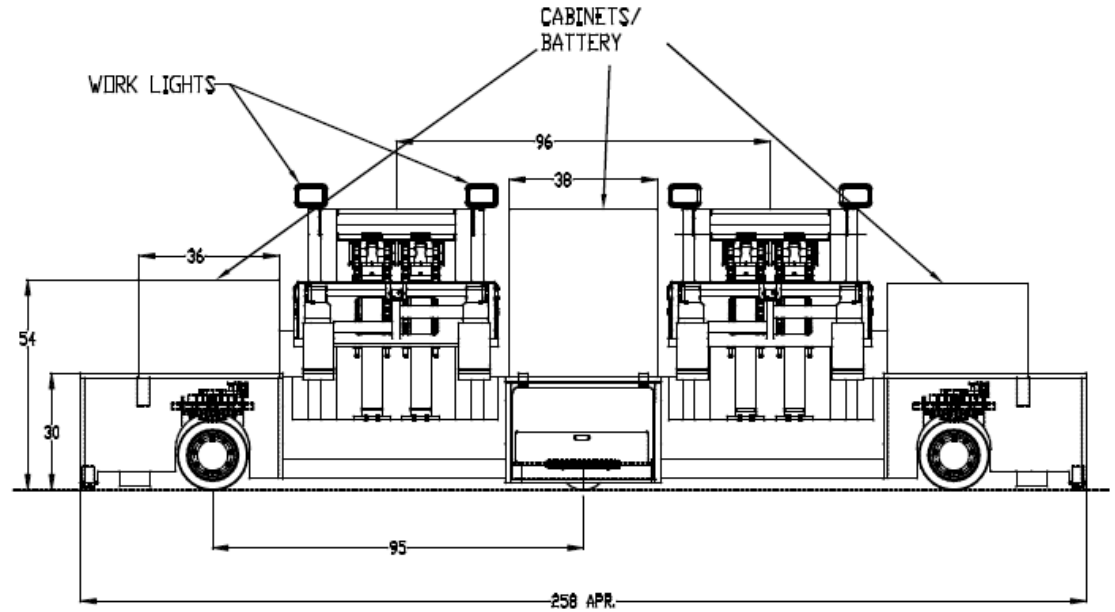
All equipment is supported via HSML's Professional Services Group. This team provides replacement parts, service, inspections and site assistance. In addition, HSML's services include engineering support on-site, on-line or via conference call.

PRELIMINARY

sroka™
MATERIAL HANDLING

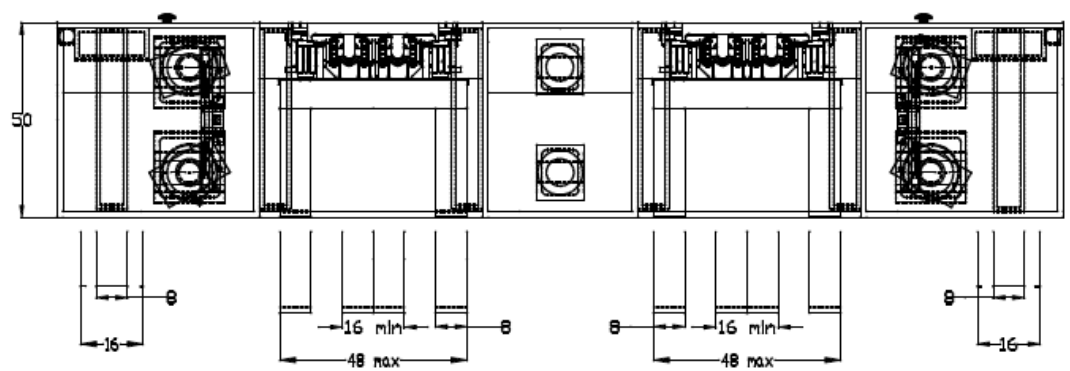
CABINETS/BATTERY





FNAL-410-E

CAPACITY: 41,000# @ 17.5" L.C. (20,500# EACH MAST)
(2) REACH MASTS
28" LONG FORKS
8" WIDE
TILT FUNCTIONS
SIDESHIFT & POSITIONER FUNCTIONS
MAX LIFT HEIGHT: 40"
STORED MIN LIFT HEIGHT: 31.5"
EXTENDED MIN LIFT HEIGHT 20"
(2) STABALIZERS W/ SIDE SHIFT
(4) STEER & DRIVE WHEELS
FRONTWHEEL/REARWHEEL DRIVE
(2) CENTER WHEELS
WORKING LIGHTS
WIRELESS REMOTE CONTROL W/ EMERGENCY STOP
INTEGRATED PROGRAMMABLE SAFETY FEATURES



*PLEASE NOTE THE FOLLOWING DRAWING IS PRELIMINARY AND IS SUBJECT TO CHANGE

sroka™ MATERIAL HANDLING	PART NAME: PROPOSAL OUTLINE DRAWING	MATERIAL: SROKA MODEL FNAL-410-E	WHERE USED	DATE: 01/24/2020
			DR BY: R.H.	SCALE: DO NOT SCALE
				DRAWING No.: SK9677-202

EASY STREET MATERIAL HANDLING EQUIPMENT

Company:
Attn: Robert Maginot
Fermilab National Accelerator Laboratory
United States Department of Energy
Kirk Rd & Pine St.
Bataivia, IL 60510

Proposal No. | 009677-1	Date | 02/10/2020	Customer | Fermilab	Page 1 of 2

Model:	FNAL-410-E
Description:	Heavy Duty Electric Remote-Controlled Magnet Handler Built to ANSI/UL 583 Type "E" Classification **Reference Drawing SK9677-202**
Capacity:	41,000 Lbs. Total @ 17-1/2" Load Center – 20,500 Lbs. Each Mast
Chassis:	All Steel Construction, Approximately 50" OAW x 258" OAL x 79" OAH
Voltage:	72V
Controller:	Four (4) AC Curtis Controllers
Transmission:	Four (4) Heavy Duty Reduction Helical Gear Drive
Steering: Traction	Full Time Power Steering
Motor Brake:	Four (4) Heavy Duty, AC, IP, 44 Sealed Class F Insulated
Drive Tire:	Four (4) Electromagnetic Fail-Safe Brakes
Additional:	Four (4) Steer and Drive Tires, Front and Rear Wheel Drive
Wheels Travel:	Two (2) Center Support Wheels
Speed:	T.B.D.
Battery Case:	Two (2) 18" x 36" For Overhead Removal Two (2) Industrial Batteries 18-125-13, 36Volt, 750 Amp Hour – **INCLUDED** Two (2) Industrial Battery Chargers, 3NE-18-750, 3 Phase, 240V, 60Hz - **INCLUDED**
Battery Connector:	Two (2) SB-350-Gray – 20" Battery Lead at Position B
Controls:	Custom HBC Radiomatic Control with Emergency Stop
Paint:	Safety Yellow or Safety Orange
Lift:	31-1/2" Min. Stored – 20" Min. Extended - 40" Maximum
Reach:	31" Reach (81" Extended Length)
Forks:	Two (2) Sets 8" Wide x 28" Long 48" Max. Width Over Forks, 16" Minimum Width Tilt Function, Side Shift, Fork Positioner Function
Safety Features:	Horn, LCD BDI w/ Hour Meter, Low Battery Lift Interrupt, Working Lights, Two (2) Stabilizer Bars w/ Side Shift, Emergency Stops on Unit Amber Strobe Light, Pole Mounted Safety Travel Alarm
Delivery:	12 to 15 Months A.R.O., Down Payment & Signed Approval Drawing(s) – FOB Strongsville, Ohio 44149, USA
Terms:	25% Non-Refundable Deposit with Order 25% Upon Approval of Final Print Drawing 40% Prior to Shipment, Upon Final Approval at the Sroka Cleveland Facility 10% Net 30 After Shipment
Net Price:	$485,240.00
Warranty:	6 Months Labor, 12 Month Parts, Unlimited Hours, Best in Class Service
Notes:	Manufactured to Meet or Exceed ANSI B-56.1 Safety Standards Electronic Parts/Service Manual F.O.B. Strongville, Ohio Battery & Charger Included

EASY STREET MATERIAL HANDLING EQUIPMENT

Company:
Easy Street Material Handling Eq.
148 Easy Street
Carol Stream, IL 60188
USA

Proposal No. | 011760-1	Date | 03/12/2024	End User | Fermilab	Page 1 of 2

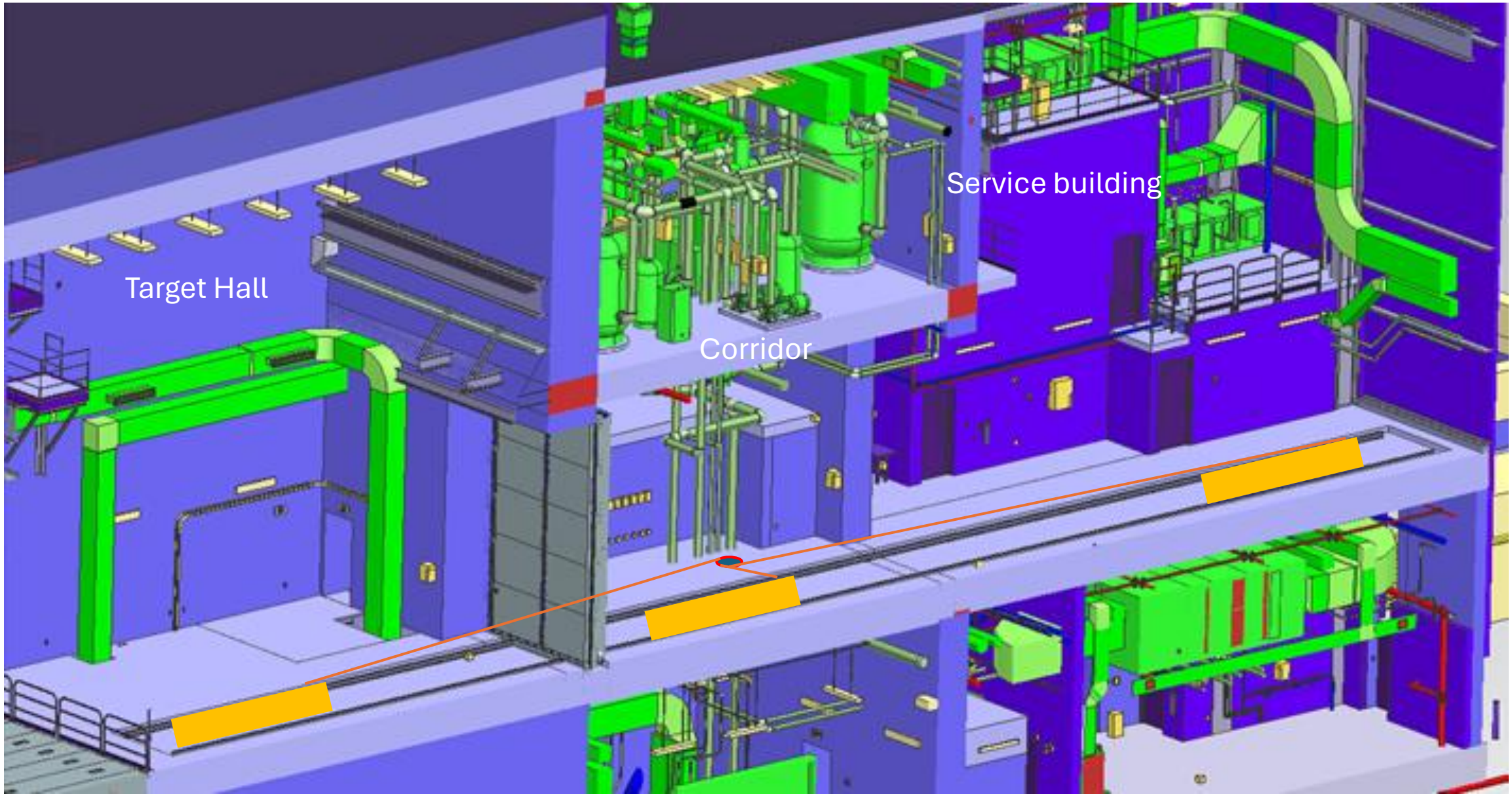
Model	FNAL-410-E
Description	Heavy Duty Electric Remote-Controlled Magnet Handler Built to ANSI/UL 583 Type "E" Classification **Reference Drawing SK9677-202**
Capacity	41,000 Lbs. Total @ 17-1/2" Load Center – 20,500 Lbs. Each Mast
Chassis	All Steel Construction, Approximately 50" OAW x 258" OAL x 79" OAH
Voltage	72V
Controller	Four (4) AC Curtis Controllers
Transmission	Four (4) Heavy Duty Reduction Helical Gear Drive
Steering	Full Time Power Steering
Traction Motor	Four (4) Heavy Duty, AC, IP, 44 Sealed Class F Insulated
Brake	Four (4) Electromagnetic Fail-Safe Brakes
Drive Tire	Four (4) Steer and Drive Tires, Front and Rear Wheel Drive
Additional Wheels	Two (2) Center Support Wheels
Travel Speed	T.B.D.
Battery Case	Two (2) 18" x 36" For Overhead Removal Two (2) Industrial Batteries 18-125-13, 36Volt, 750 Amp Hour – **INCLUDED** Two (2) Industrial Battery Chargers, 3NE-18-750, 3 Phase, 240V, 60Hz - **INCLUDED**
Battery Connector	Two (2) SB-350-Gray – 20" Battery Lead at Position B
Controls	Custom HBC Radiomatic Control with Emergency Stop
Paint	High Visibility Traffic White
Lift	31-1/2" Min. Stored – 20" Min. Extended - 40" Maximum
Reach	31" Reach (81" Extended Length)
Forks	Two (2) Sets 8" Wide x 28" Long 48" Max. Width Over Forks, 16" Minimum Width Tilt Function, Side Shift, Fork Positioner Function
Safety Features	Horn, LCD BDI w/ Hour Meter, Low Battery Lift Interrupt, Working Lights, Two (2) Stabilizer Bars w/ Side Shift, Emergency Stops on Unit

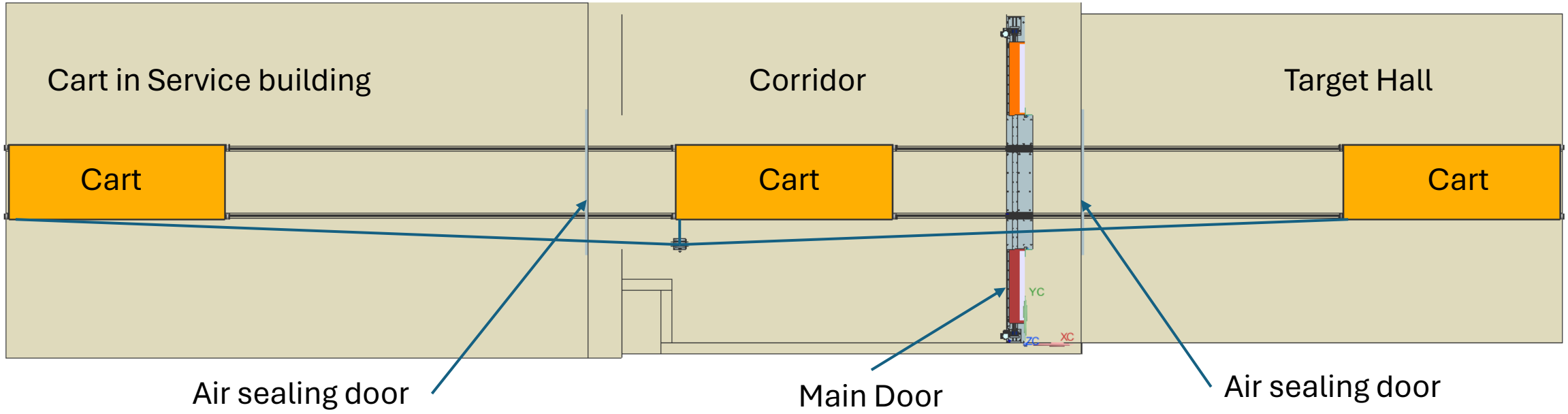
Delivery[1]	14 to 17 Months A.R.O., Down Payment & Signed Approval Drawing(s) – FOB Strongsville, Ohio 44149, USA
Terms	25% Non-Refundable Deposit with Order 25% Upon Approval of Final Print Drawing 40% Prior to Shipment, Upon Final Approval at the Sroka Cleveland Facility 10% Net 30 After Shipment
Net Price[2]	$724,995.00 Each
Delivery & Assembly	$13,500.00 Quality Assurance provisions per technical specification $25,000.00 Test per technical specification $20,000.00 Analysis and documentation per technical specification $25,000.00
Warranty[3]	6 Months Labor, 12 Month Parts, Unlimited Hours, Best in Class Warranty
Notes	Manufactured to Meet or Exceed ANSI B-56.1 Safety Standards Electronic Parts/Service Manual Freight NOT Included
Options (Dealer Pricing)	Battery & Charger Included Amber Strobe Light, Pole Mounted Safety Travel Alarm

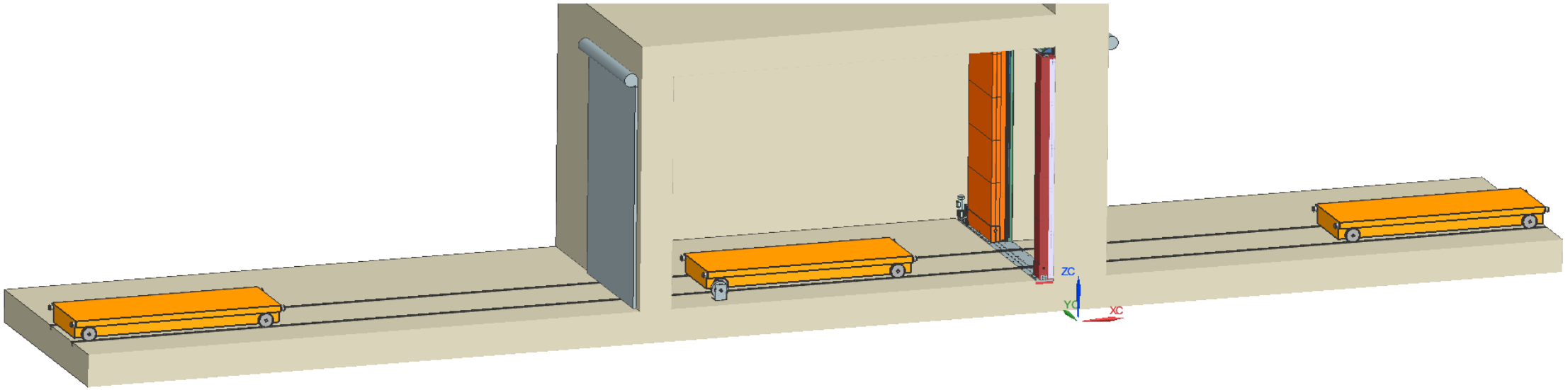
Conclusion

Two railroad carts 40 ton capacity are successfully used in the NUMI Target Hall and CO storage facilities.
Similar 60 ton cart is proposed for the LBNF Target Hall components transportation. The cart cost is low.
No reason to replace it with battery operated more expensive cart.

Transfer Cart power supply location




Cart in Service building
Corridor
Target Hall
Cart
Cart
Cart
YC
ZC
XC
Air sealing door
Main Door
Air sealing door


ZC
YC
XC

Electrical system for transfer cart and door