



SAMPLE ENGINEERING SPECIFICATION

Trident Precast Concrete Deck Truck Scale

1. PART 1 - GENERAL

1.1. Scope. This section sets forth the requirements for one above-grade truck scale. The scale shall be furnished and installed complete as specified in the following paragraphs, including platform, foundation, load cells, instruments, surge voltage protection system, and the services of the manufacturer's service representative.

1.1.1. Acceptable Manufacturer. The truck scales furnished under this section shall be manufactured by Fairbanks Scales or equal.

1.2. General. Equipment furnished and installed under this section shall be assembled, erected, and placed in proper operating condition in full conformity with drawings, specifications, engineering data, instructions, and recommendations of the equipment manufacturer unless exceptions are noted by the Engineer.

1.2.1. General Equipment Stipulations. The General Equipment Stipulations shall apply to all equipment furnished under this section.

1.2.2. Governing Standards. The scale systems shall have been issued a Certificate of Conformance by the National Type Evaluation Program, (N.T.E.P.) and shall conform to the following federal, state, local, and industrial standards.

- National Institute of Standards and Technology (NIST), Handbook 44, "Specifications, Tolerances, and Technical Requirements for Weighing and Measuring Devices".
- Applicable state regulations for commercial weighing devices.
- American Welding Society AWS D1.1, 2008.
- Weighbridge structural steel and structural steel embedments shall conform to ASTM A36.
- Reinforcing steel shall conform to ASTM A615, Grade 60.
- Concrete mix for scale deck shall be tested in accordance with ASTM standards for air entrainment (ASTM C231), slump (ASTM C143), temperature (ASTM C1064), and compressive strength (ASTM C39).
- Concrete flatwork for scale deck shall be placed, consolidated and finished in accordance with, and conform to the requirements of ACI 301 (American Concrete Institute). Finishing work shall be performed utilizing high-quality techniques conforming to the ACI standards as set forth in ACI CP-10 and shall be supervised by an ACI certified concrete flatwork technician.

1.2.3. Anchor Bolts. All anchor bolts, nuts, and washers shall be made of carbon steel or comparable, and may be plated.

1.2.4. Edge Grinding. Sharp projections of cut or sheared edges of ferrous metals, which are not to be welded, shall be ground as required to ensure paint adherence.

1.2.5. Surface Preparation. All ferrous metal surfaces, except stainless steel or plated steel, shall be blast cleaned in the shop in accordance with the paint manufacturer's recommendations. All mill scale, rust, and contaminants shall be completely removed before shop primer is applied. The components of each module shall be cleaned to an SSPC-SP6 finish prior to painting.

1.2.6. Shop Painting. All steel surfaces, except stainless steel or plated steel, shall be coated with a PPG AUE-370 high solids acrylic urethane, a two component chemically cross-linked commercial coating system. The paint system will be applied per the manufacturer's recommendations. See attached data sheet.

Additional field painting other than touchup painting of damaged surfaces will not be required.

1.2.7. Power Supply. Unless otherwise specified, the power supply to the equipment will be a dedicated 120 volt, single phase, 60 Hz connection. Where control voltages lower than the power supply voltage is required, suitable control power transformers shall be furnished.

1.2.8. Surge Voltage Protection. The scale system shall be surge and lightning protected. This protection shall include a surge protection device which plugs into a standard 115 VAC outlet. The load cells shall be optically isolated, and surge protected. The scale shall have a dual point ground rod system for the grounding of the weighbridge, power supply, and the sectional controllers. Electrical diagrams of the scale grounding and surge protection shall be supplied with submittals. The surge voltage package shall be provided as a unit and be tested and approved by the scale manufacturer.

Surge protection devices or components not designed or tested by the scale manufacturer as a unit are unacceptable.

1.3. Submittals. Complete foundation and installation drawings, together with detailed specifications and data covering materials, parts, devices, and accessories forming a part of the equipment furnished, shall be submitted in accordance with the submittals section. Drawings shall cover all scale components, foundation details, and pier loading information necessary for the design of the scale foundation or installation.

2. PART 2 – PRODUCTS

2.1. Scale Design

2.1.1. General Description. The scale shall be a Fairbanks' Trident precast concrete deck, above-grade, fully-electronic truck scale with rocker column load cells. Scale shall be a "flat top" orthotropic design and not require side beams above the surface of the deck. Equipment is to consist of parts designed to act as a unit by a manufacturer experienced in design, construction, manufacture of electronic components, as well as operation of equipment for the purpose required.

2.1.2. Scale Capacity and CLC. The N.T.E.P. approved scale shall have a minimum capacity of _____ tons and have a minimum concentrated load capacity (CLC) of 80,000 lbs.

2.1.3. Scale eMin. The N.T.E.P. approved scale shall have an eMin (as defined by NIST HB 44) approval of 10 lbs. The current NTEP Certificate of Conformance shall be provided as part of the project documentation package to support this approval.

2.1.4. Weighbridge Design. The platform shall be _____ feet long and _____ feet wide and be comprised of nominal 4" factory poured and cured concrete deck reinforced by 8" structural steel wide flange beam stringers which run the full length of the module. Side beams shall be 12" structural steel members having nelson studs attached to the internal sides of each beam to create a composite connection between the concrete and the steel. The scale shall be an open bottom design. There shall be no corrugate sheeting entombed within the modules. Scale shall not require access plates on deck surface to service load cells or junction boxes. Removable cover plates are not acceptable on deck surface. Understructure components consisting of formed U's or bent plates shall not be used.

The maximum deflection for legal highway loads shall not exceed $1/1300^{\text{th}}$ of span and the bending stress in any member shall not exceed 20,000 psi at the rated CLC of 80,000 lbs.

2.1.5. Checking. The scale shall utilize longitudinal and lateral bumper checking. The scale shall be completely self-checking. No check rods or flexure checking plates are to be used. Checking shall be mechanically isolated from the load cell and load cell stands/base plates.

2.1.6. Load Cell and Controller/Junction Box Specifications. The scale shall have a rocker column load cells. Each rocker column load cell shall have a minimum gross rated capacity of 66,000 lbs each. The load cells shall be constructed of

stainless steel and shall be completely hermetically sealed to prevent moisture from entering the cell. Load cells shall be nitrogen filled to retard internal corrosion. Load cells shall meet the following specifications:

Design	Rocker column
Load cell material:	Stainless Steel, 17-4 PH
Minimum capacity:	66,000 lbs
Maximum Height:	5.5"
Protection:	NEMA 6P/IP69K
Excitation voltage:	5 to 15 Volts
Input resistance (ohms):	1150 +/- 50
Output resistance (ohms):	1000 +/- 2
Insulation resistance (megohms):	≥5000
Operating temperature:	-40 to 176°F (-40 to 80°C)
Safe load limit (% of Capacity):	200%
Ultimate load (% of Capacity):	300%
Minimum dead load:	0
Rated Output (mV/V):	2.0
Load cell cable:	Stainless steel braid
Sealing:	Hermetically sealed; cable entry sealed by glass to metal header
NTEP Accuracy Class:	IIIL, 10,000 divisions

The load cell shall have an available 25 year warranty.

The load cell shall be provided with a shielded, 4 conductor cable with a polyurethane jacket. Load cell cabling shall be protected by a stainless steel braided armor to protect against abrasion or rodent damage. Load cell cables must be hard wired to the load cell. "Quick disconnect" load cell cable connectors on cells or on junction boxes are not acceptable.

Load cell output shall be a DC analog signal. Load cells with digital output shall not be acceptable. Each load cell shall be optically isolated via a smart sectional controller. PC boards shall be encapsulated in epoxy or similar material. A board that is not protected in this fashion is unacceptable. Furthermore, each encapsulated board shall be housed in a type 304 Stainless steel enclosure rated NEMA 4X. Access to the encapsulated board within the smart sectional controller enclosure shall be achieved without the use of tools. Bolts, screws or other hardware shall not be used to seal the smart sectional controller enclosure.

The scale shall have self diagnostic capabilities able to identify load cell problems, failure, and predict failure before it occurs to prevent downtime. The diagnostics are to measure load cell counts (not weight) and will be used to determine reliability. Should a load cell fail, the instrumentation shall identify the

specific load cell that has failed. All trouble shooting shall be done from within the scale house.

2.2. Platform and Foundation Requirements. The weighbridge and load cell assemblies shall be supported by a reinforced concrete pier type or full slab foundation as indicated on the drawings. The dimensions for the scale foundation and platform shall be as recommended by the equipment manufacturer and accepted by the Engineer. Reinforcing steel placement and structural steel embedment placement shall be performed as shown on the manufacturer's foundation drawings.

The scale manufacturer shall furnish the following items for construction of the scale platforms and pits:

- Weighbridge modules with an ultimate 8,000 psi compressive strength concrete deck
- The weighbridge deck concrete system shall contain silicate fume at a rate of at least 10% of the cementitious material and shall contain steel fiber reinforcement for tensile strength and impact protection.
- Longitudinal and lateral bumper checking devices
- Load cells and load cell assemblies
- Anchor bolts
- Platform and end wall painted structural steel embedments

3. PART 3 – EXECUTION

3.1. Installation. The scale shall be manufactured, provided, and installed by a scale company that has a minimum of five years of experience installing similar truck scale systems.

The installer shall configure the scale system as indicated on the certified drawings. All deck concrete flat work finishing shall be performed utilizing high-quality techniques conforming to American Concrete Institute standards as set forth in ACI CP-10 and shall be supervised by an ACI certified concrete flatwork technician. Anchor bolts shall be set as required by the scale manufacturer's drawings.

3.2. Manufacturer's Field Services. Where scheduled in the equipment schedule section, an experienced, competent, and authorized representative of the manufacturer shall provide field services for equipment furnished under this section. Field services shall meet the requirements of Manufacturer's Field Services in the quality control section.

3.3. Field Testing and Acceptance. An authorized manufacturer's representative shall provide the required scale certification for capacity and accuracy to the Engineer as required by the applicable state department of weights and measures and any other applicable state or county agency.

3.4. Personnel Training. An experienced, competent, and authorized representative of the manufacturer shall train the Owner's personnel in operating, maintaining, and repairing the equipment specified in this section. The training provided shall meet the requirements of Personnel Training Services in the quality control section. The number of training sessions and duration of each session shall be as scheduled in the equipment schedule section.

End of Section



DTM Polyurethane

AUE-370

AUE-370 is a surface tolerant, high solid, high build, two component acrylic urethane formulated for direct-to-metal applications. The product is easy to mix and apply for airless or air-assisted spray applications.

This product is compliant for applications in areas with VOC requirements of less than 2.8 lbs/gal (340 g/l).

Features and benefits:

- Apply direct-to-metal
- Airless or Air-assisted application capable
- 2.8 VOC capable

Associated Products:

- AUE-3501, 2K High Solids Urethane Hardener
- GXH-1086, Urethane Hardener
- UA-11, Urethane Accelerator

Physical Constants*:

	With AUE-3501	With GXH1086
Weight per gallon (US)	9.43 - 10.50 lbs/gal	9.33 - 10.35 lbs/gal
Percent solids (by weight)	61.0 - 68.2%	59.5 - 66.7
Percent solids (by volume)	57.0 - 61.3%	55 - 59.1%
Flashpoint	86°F (30°C) - AUE-370	86°F (30°C) - AUE-370
VOC	2.25 - 2.65 lbs/gal (RTS, unreduced)	2.44 - 2.8 lbs/gal (RTS, unreduced)
HAPs	< 0.1 lb/gal (RTS, unreduced)	< 0.1 lb/gal (RTS, unreduced)
Photo-chemically reactive	Non-Photochemically Reactive	Non-Photochemically Reactive

* Constants vary from color to color

Directions for Use:

Substrate Preparation:

The surface to be coated must be free of all contamination (including moisture, dust, dirt, oil, grease, and oxidation). Substrate preparation has a direct relationship to the performance of a coating.

SSPC-SP15 Commercial Grade Power Tool Cleaning is minimum preparation, this includes but is not limited to a 1.0 mil blast profile minimum.

Commercial Blast Cleaning is recommended (SSPC-SP6, NACE #3) to maximize adhesion and performance properties of the finished coat.

Variability can occur with substrates, preparation, application method or environment. We recommend that adhesion and system compatibility be checked prior to full application.

Metal	Direct to Substrate
Cold Rolled Steel	Recommended
Hot Rolled Steel	Recommended
Galvanneal	Recommended
Galvanized	Recommended
Aluminum	Recommended
Plastic / Fiberglass	Not Recommended.

Note: For acceptable compatibility between this topcoat and CPC primers please see the CPC Primer/Topcoat compatibility chart (CPC.TB01).

AUE-370

Directions for Use (continued)

Mix Directions:



Mix Directions

Stir thoroughly before and occasionally during use.

Mix component "A" AUE-370 Color thoroughly before blending. Once component "B" is added, product must be adequately mixed prior to use. A mechanical mixer is recommended. UA-11 may be added, if desired, up to 6 oz. / RTS GAL.

Use with adequate ventilation. Keep out of reach of children.

Thinning:

Up to 10% Q70 (MAK) can be added to RTS AUE-370 where VOC regulations allow. Thinning in this manner will not exceed 3.5 VOC as applied.



Blend Ratio: w/AUE-3501:

Without UA-11		With UA-11		
AUE-370	AUE-3501	AUE-370	AUE-3501	+ UA-11
5	1	5	1	6oz. / RTS Gal



Pot Life @ 77°F:

2 – 3 hours

1 – 2 hours

Spray Viscosity Range:

30 – 40 sec. #3 EZ Zahn

20 – 30 sec. #3 Zahn EZ



Blend Ratio: w/GXH-1086:

Without UA-11		With UA-11		
AUE-370	GXH-1086	AUE-370	GXH-1086	+ UA-11
4	1	4	1	6oz. / RTS Gal



Pot Life @ 77°F:

2 – 3 hours

1 – 2 hours

Spray Viscosity Range:

25 – 35 sec. #3 Zahn EZ

20 – 30 sec. #3 Zahn EZ

Application Equipment:



Conventional:

1.6 - 2.0 mm fluid tip, 50 - 65 psi

Conventional on Pressure Pot:

1.3 - 1.8 mm fluid tip, 12 - 20 ounces per minute fluid

HVLP:

1.4 - 1.8 mm fluid tip, maximum psi per gun MFG settings

HVLP on Pressure Pot:

1.3 - 1.8 mm fluid tip, 12 - 20 ounces per minute fluid

Airless:

.013 - .017 fluid tip, 2000 psi and up fluid pressure

Air-Assisted Airless:

.013 - .017 fluid tip, begin at 1400 psi fluid & minimum required air pressure to remove tails from pattern

Brush or Roll:

High Quality Natural Bristle Brush
High Quality 3/8" nap roller cover with a solvent resistant core

Electrostatic:

Information above incorporated with gun MFG settings

Application:



Apply:

1 – 2 coats

Recommended

Wet Film Build:

5.0 – 8.5 mils

Recommended

Dry Film Build:

3.0 – 5.0 mils

Coverage (varies by color):

915 – 982 sq. ft. at 1.0 mil dry film per U.S. gallon

Dry Times:



Air Dry @ 77°F 50% RH:

Without UA-11

With UA-11

To Texture

3 – 5 hours

1 – 2 hours

To Handle

8 – 12 hours

2 – 4 hours

Recoat

Min, When Dry Through
Max. 7 days

Min, When Dry Through
Max. 7 days

Paint film is not fully cured for 7 days. Drying time listed may vary, depending upon film build, color selection, temperature, humidity and degree of air movement.

AUE-370

Technical Data*

Performance Properties:

Test	ASTM Method	Without UA-11	With UA-11
Pencil Hardness	ASTM D3363	H-2H	H-2H
Impact (direct)	ASTM D2794	80"lbs	80"lbs
Mandrel	ASTM D522	1/8" No Cracks	1/8" No Cracks
Chip Resistance	ASTM 3170	8	8
Gloss - 60°	ASTM D523	85 - 92	85 - 92
Adhesion	ASTM D3359 Method B	5B	5B

Chemical Resistance:

Chemical ASTM D1308	Without UA-11	With UA-11
Xylene	Slight Swell - recovers	Slight Swell - recovers
10% NaOH (Sodium Hydroxide)	No Effect	No Effect
10% HCl (Hydrochloric acid)	No Effect	No Effect
10% H ₂ SO ₄ (Sulphuric acid)	No Effect	No Effect
10% HNO ₃	Slight Stain	Slight Stain
Hydraulic Oil	No Effect	No Effect
Gasoline	Slight Swell - recovers	Slight Swell - recovers
Diesel Fuel	No Effect	No Effect
Water	No Effect	No Effect

Weather Resistance:

	ASTM Method	Without UA-11	With UA-11
Salt Spray – 1000 hours	B117		
Corrosion Creep	D1654	7A - 8A	7A - 8A
Face Blisters	D714	None	None
Adhesion	D3359 Method A	10A	10A
Humidity – 100 hours	D2247		
5 Minute Recovery Adhesion	D3359 Method B	5B	5B
1 Hour Recovery Adhesion	D3359 Method B	5B	5B
24 Hour Recovery Adhesion	D3359 Method B	5B	5B
QUV-UVA: 60° angle	D4587		
500 hour retention	D523	98%	98%
1000 hour retention	D523	98%	98%
QUV-UVB: 60° angle	D4587		
500 hour retention	D523	90%	90%
1000 hour retention	D523	65%	65%

All tests results assume proper cure and preparation of test substrates. Unless otherwise stated, all results were obtained spraying product direct to metal on HRS with Commercial Blast Cleaning (SSPC SP6), and product color is black. QUV tests were performed over B1000 steel.

* The application and performance property data above are believed to be reliable based on laboratory findings. It is for the buyer to satisfy itself on the suitability of the product for its particular use. Variation in environment, procedures of use, or extrapolation of data may cause unsatisfactory results.

AUE-370

DTM Polyurethane

Safety:



These materials are designed for application only by professional, trained personnel, using proper equipment under controlled conditions and are not intended for sale to the general public.

Safe application of paints and coatings requires knowledge of equipment materials and individual training. Directions and precautionary information on both equipment and products should be carefully read and strictly observed for personal safety and property protection. Consideration must be given to eliminate conditions, which may generate hazardous atmospheres during spray application or subject operators or bystanders to injury or illness.

Special precautions must be taken when utilizing spray equipment, particularly airless equipment. High-pressure injection of coatings into the skin by airless equipment may cause serious injury requiring immediate medical attention at a hospital. Treatment advice may also be obtained from Poison Centers.

Air quality should be maintained with adequate ventilation; applicators can achieve additional protection by wearing respirators and other protective garments such as gloves and overalls. In all cases, wear protective eye equipment. During the application of all coatings materials, all flames, welding and smoking must be prohibited. Explosion proof equipment must be used when coating these materials in confined areas.

PRECAUTIONARY INFORMATION

Before using the products listed herein, carefully read each product label and follow directions for its use. Please read and observe all warnings and precautionary information on all product labels. Prevent all contact with skin and eyes and breathing of vapors and spray mist. Repeated inhalation of high vapor concentrations may cause a series of progressive effects including irritation of the respiratory system, permanent brain and nervous system damage and possible unconsciousness and death in poorly ventilated areas. Eye watering, headaches, nausea, dizziness and loss of coordination are indications that solvent levels are too high. Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

KEEP OUT OF THE REACH OF CHILDREN

MEDICAL RESPONSE

Emergency Medical or Spill Control Information (412) 434-4515; CANADA (514) 645-1320
Have label information available.



Material Safety Data Sheets for the PPG products mentioned in this publication are available through your PPG Distributor.

For additional information regarding this product, see the MSDS AND LABEL information.

PPG Industries Commercial Coatings

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Part No. CFCPB22B 11/07

(PROJECT NAME)

(CONTRACT NO.)

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