

**Manufacturing, Supply & Quality Plan for Tower Bolts**

**Project: SL Tower Bolt Market Penetration**

Document History		
Version		Date
Original Document	First Submission	Feb 9, 2013
Rev1	Requested Revisions Comments	Feb 11, 2013
Rev2	Heavy Hex Nut revised to Hex Nut, minor other changes	Feb 26, 2013
Rev3	Reference Mechanical, Chemical References, 2/28 Review & requested changes	Mar 5, 2013

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# Corporate Resume

## Company Information

Founded in 1887, SLSB, LLC dba St. Louis Screw & Bolt is one of the longest operating bolt manufacturers in the United States. SLSB has manufactured and supplied threaded fasteners for many well-known civil engineering projects in the US and the world and has specialized capabilities in the manufacture of heavy hex bolts for use in structural applications. SLSB is a long time member of American Institute of Steel Construction (AISC), National Steel Bridge Alliance (NSBA) and is active in many other trade and specification writing organizations.

At SLSB our commitment is to provide the customer and project with not only physical products, but un-matched service and technical knowledge of fastener systems. It is SLSB's goal to maintain constant communication with our customers and end users. Creating a team atmosphere we strive to become integrated with our clients working towards the common goal of a successful project. Open and continuous updates during our projects instills trust for handling whatever obstacles may come.

### Structural Fasteners provided but not limited to the following ASTM standards

- ASTM A325
- ASTM A490
- ASTM A394
- ASTM A449
- ASTM A307
- ASTM A354
- ASTM F1852
- ASTM F2280
- ASTM F1554

## Projects

- St Louis Gateway Arch
- Carquinez Bridge 2004
- Chicago McCormick Place Expansion
- St Louis Cardinals Busch Stadium
- Dubai Intl. Airport Terminal 3
- Huey P. Long Bridge Widening
- Intel FAB 42 Semiconductor Mfg
- Intel D1X Research Facility
- World Trade Center Museum Pavilion
- Ivanpah Solar Electric Gen. System
- Kearsarge Oil Sands Project
- Wood River Refinery

over 270 million fasteners supplied since 2003

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## Manufacturing, Supply & Quality Plan

### Manufacturing & Supply:

SLSB will manufacture and supply bolts, nuts & washers listed in the drawings contained in this plan to all applicable ASTM International/ASME standards. This would include any and all sampling & testing requirements required within the referenced specifications.

#### **ASTM International standards;**

[A394-08e1](#) Standard Specification for Steel Transmission Tower Bolts

[A563-07a](#) Specification for Carbon and Alloy Steel Nuts

[A751-11](#) Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products

[B487-85\(2007\)](#) Test Method for Measurement of Metal and Oxide Coating Thickness by Microscopical Examination of Cross Section

[D3951-10](#) Practice for Commercial Packaging

[E376-11](#) Practice for Measuring Coating Thickness by Magnetic-Field or Eddy-Current (Electromagnetic) Testing Methods

[F606-11a](#) Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, Direct Tension Indicators, and Rivets

[F788/F788M-12](#) Specification for Surface Discontinuities of Bolts, Screws, and Studs, Inch and Metric Series

[F812/F812M-12](#) Specification for Surface Discontinuities of Nuts, Inch and Metric Series

[F1470-12](#) Practice for Fastener Sampling for Specified Mechanical Properties and Performance Inspection

[F1789-12](#) Terminology for F16 Mechanical Fasteners

[F2329-11](#) Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners

[G101-04\(2010\)](#) Guide for Estimating the Atmospheric Corrosion Resistance of Low-Alloy Steels

#### **ASME Standards;**

[B18.18-2011](#) This Quality focused standard establishes in-process and final inspection requirements for fastener products as well as a receiving inspection plan for fastener purchasers.

[B18.2.1-2010](#) Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series)

[B18.2.2-2010](#) Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series)

[B18.21.1-2009](#) Washers; Helical Spring-Lock, Tooth Lock, & Plain Washer (Inch Series)

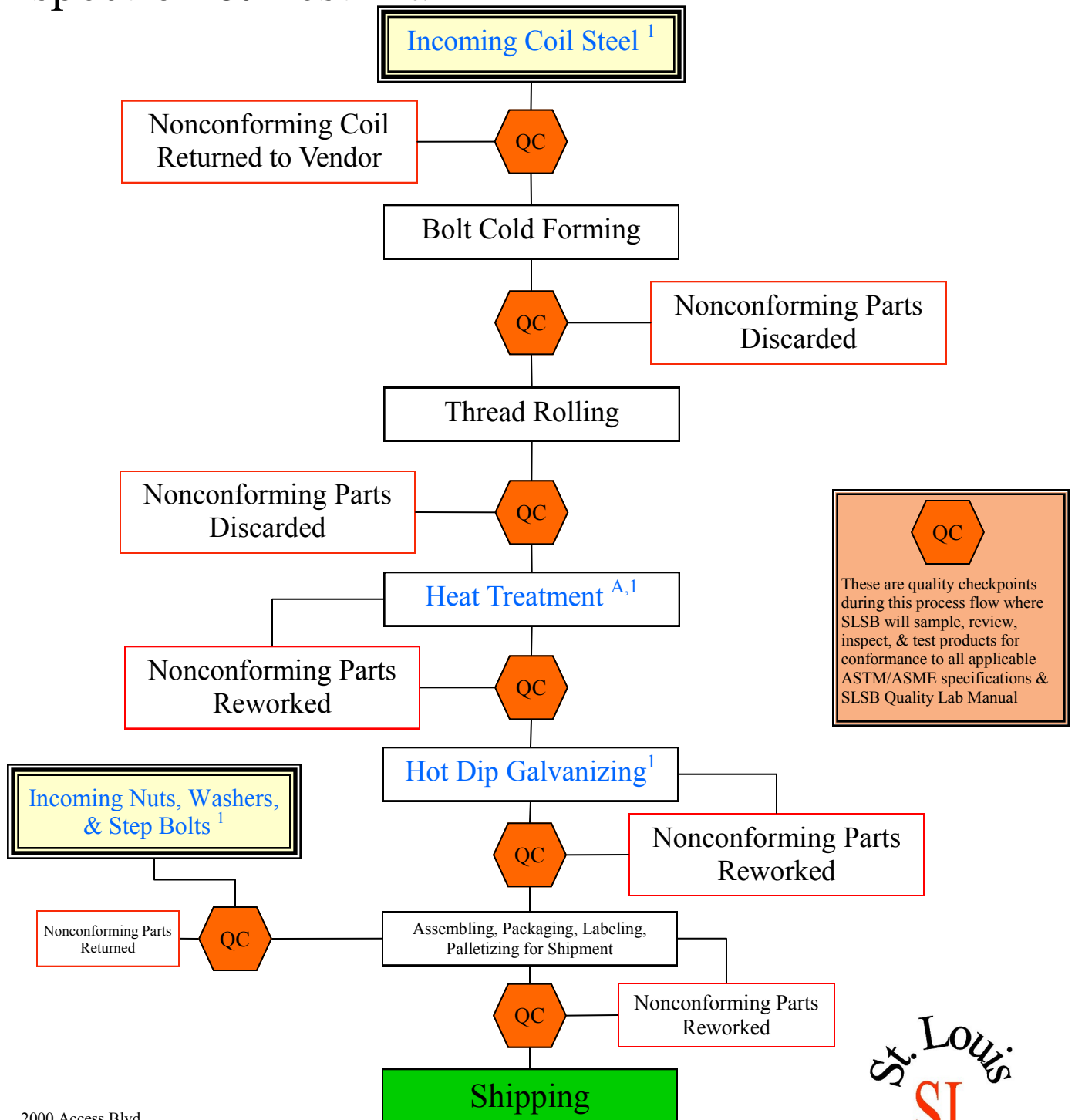
[B1.1-2003](#) Unified Inch Screw Threads, (UN and UNR Thread Form)

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# Process Flow Chart / Inspection & Test Plan

SLSB, LLC dba St. Louis Screw & Bolt



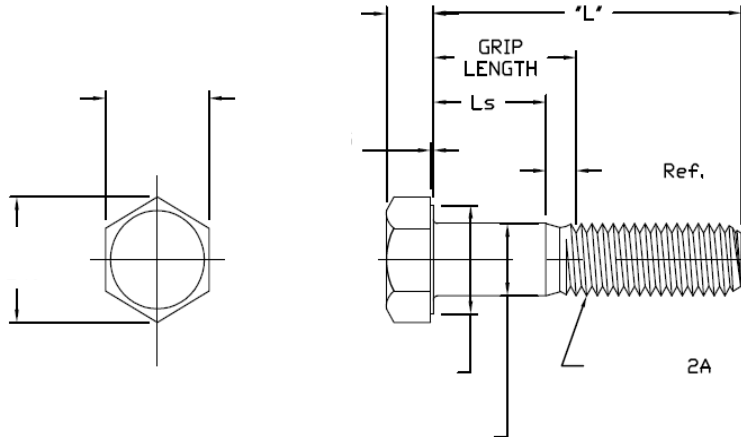
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<sup>A</sup> Type 1 Quenched & Tempered, Type 0 stress relief annealed

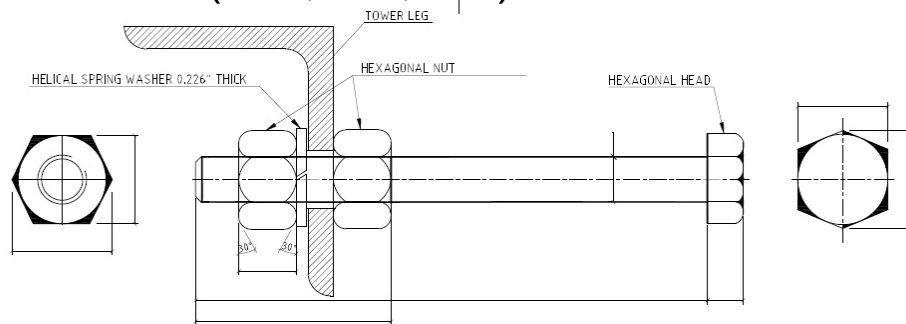
<sup>1</sup> Vendor Supplied Product or Service

St. Louis  
**SL**  
1887  
Screw & Bolt

## HEX TOWER BOLTS (5/8", 3/4", 7/8")



## HEX STEP BOLTS (5/8", 3/4", 7/8")



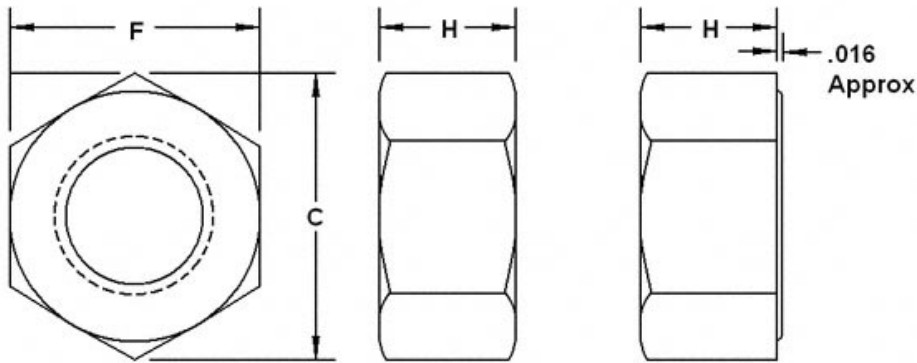
Notes:

- All dimensions not shown per ASTM A394-08e1, ASME B18.2.1-2012 hex bolts in inch
- All mechanical, hardness & chemical properties per ASTM A394-08e1
- All bolts to conform to A394-08e1 Type 1 or Type 0 as specified by the purchase order
- Head of bolt marked per ASTM A394-08e1
- Thread shall rolled type and be per ASME B1.1-2003 UN coarse & class 2A tolerance
- Each bolt provide with 1 hex nut conforming to A563-07a Grade DH with S1 & S2 supplementary requirements for wax lubricant and color dye
- Each bolt assembly provided with one helical spring lock washer conforming to ASME B18.21.1-2009
- All bolts, nuts and washers hot dip galvanized per ASTM F2329-11 & additional requirements for coating thickness per ASTM A394-08e1 Sections 4.4.1 through 4.4.4

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## Hex Nuts (5/8", 3/4", 7/8")

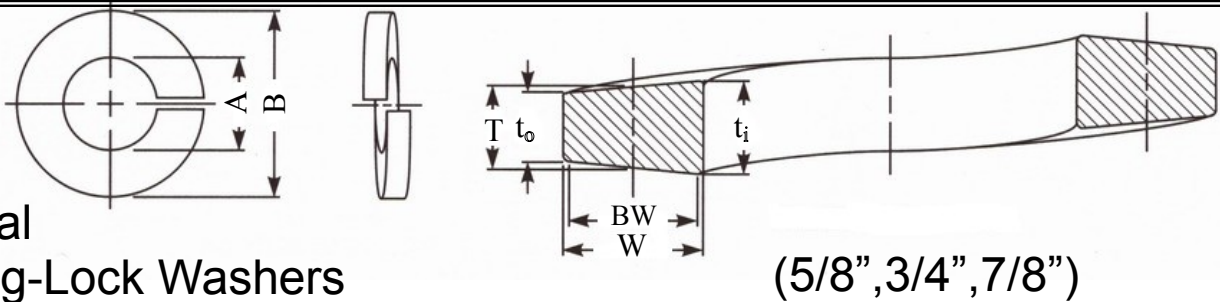


### Notes:

- All dimensions inch, any not shown per ASMB B18.2.1-2012
- All mechanical and chemical properties per ASTM A563-07a DH Hex
- Hex nuts conforming to A563-07a Grade DH with S1 & S2 supplementary requirements for wax lubricant and color dye
- Each hex nut hot dip galvanized per ASTM F2329-11 & additional requirements for coating thickness per ASTM A394-08e1 Sections 4.4.1 through 4.4.4
- Nuts tapped oversize (max over-tap per specification) after hot dip galvanizing threads conforming ASME B1.1-2003 Class 2A

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## Helical Spring-Lock Washers

### Notes:

- All dimensions inch
- Each washer conforming to ASME B18.21.1-2009
- Each washer hot dip galvanized per ASTM F2329-11& additional requirements for coating thickness per ASTM A394-08e1 Sections 4.4.1 through 4.4.4
- All mechanical, hardness, & twist properties per ASME B18.21.1-2009 Carbon Steel

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## **Packaging, Certifications, Shipping & Delivery**

### **Sampling & Quality Testing:**

- All parts supplied shall be sampled & tested in accordance to all referenced ASTM & ASME requirements

### **Packaging:**

**(standard, custom packing available upon request)**

- All tower bolts to be shipped assembled bolt, nut & spring lock washer
- All step bolts to be shipped assembled bolt, 2 nuts & spring lock washer
- All bolts, nuts and washers packaged according to size and type
- 5 Gallon RPK (Rigid Polyethylene Keg) to be used for all components
- Weight of each RPK not to exceed 50 KG, while maintaining increments of 25 or 100
- RPK's labeled with the following;
  1. ASTM Specification designation
  2. Grade
  3. Size (diameter & length)
  4. Number of pieces
  5. Manufacturer
  6. Country of Origin
  7. PO number
- RPK's palletized single high, steel banded, plastic wrapped on 36"x36" pallets
- Mixing of sizes and types on single pallets shall be minimized to the greatest extent possible

### **Certification:**

SLSB shall furnish the purchaser test reports that includes the following:

- Heat analysis and heat number
- Results of hardness and tensile tests, and shear tests
- Zinc hot dip galvanizing coating average thickness of the production lot shall be furnished for coated bolts, nuts and washers
- Statement of compliance of visual inspection for surface discontinuities
- Results of compliance with dimensional and thread fit requirements
- Lot number and purchase order number
- Complete mailing address of responsible party, and, Title and signature of the individual assigned certification responsibility by the company officers

### **Shipping & Delivery:**

- SLSB to schedule deliveries per the needs of the purchaser
- Shipments in van type delivery truck protected from weather

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