



# E2 BEARING & SHEAR KEY ANCHOR RODS – REV.1

(2010) – 192 Rods

Fabrication and Installation Processes



# STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

# NOTICE TO CONTRACTORS AND SPECIAL PROVISIONS

## FOR CONSTRUCTION ON STATE HIGHWAY IN

SAN FRANCISCO COUNTY IN SAN FRANCISCO

FROM 0.6 KM TO 1.3 KM EAST OF THE YERBA BUENA TUNNEL EAST PORTAL

**DISTRICT 04, ROUTE 80** 

For Use in Connection with Standard Specifications Dated JULY 1999, Standard Plans Dated JULY 1999, and Labor Surcharge and Equipment Rental Rates.

> CONTRACT NO. 04-0120F4 04-SF-80-13.2/13.9

Bids Open: February 1, 2006 Dated: August 1, 2005

OSD

#### **10-1.47 SPHERICAL BUSHING BEARING (PIER E2)**

This work shall consist of fabricating and installing the spherical bushing bearing on Pier E2 in conformance with details shown on the plans and the requirements of these special provisions.

The spherical bushing bearing consists of spherical bushing assembly, bearing top housing, bearing bottom housing, bearing hold down assembly, retaining ring plates, solid shaft, dust cover, base plate, bearing plate, anchor bolts, and assembly bolts. The lubricant shall be self-lubricated and shall be provided for all bronze surfaces and other surfaces as shown on the plans. Bearings shall be anchored in place with high strength non-shrink grout.

Spherical bushing bearings shall be furnished and installed at Pier E2.

#### GENERAL

Attention is directed to "Steel Structures," of these special provisions for steel casting requirements.

Attention is directed to "Shear Key (Pier E2)," of these special provisions for additional installation requirements.

Attention is directed to "Lubricant and Test," of these special provisions.

The design loads, design rotations, design displacements, and alignment tolerances shall conform to the values as shown on the plans.

#### WORKING DRAWINGS

The Contractor shall submit working drawings in conformance with the provisions in "Working Drawings," of these special provisions.

Working drawings shall include complete details, information, drawings, and substantiating calculations of the spherical bushing bearing and its components and the method, materials, equipment, and procedures of fabrication and installation that the Contractor proposes to use including the placement of high strength non-shrink grout.

Working drawing submittals shall include the following:

- A. Bearing fabrication plans for all bearings including complete details for each component.
- B. All ASTM, AASHTO, or other material designations including dust cover and its connection to other bearing components, and retaining ring plates.
- C. The bushing wall thickness, fits, and tolerances.
- D. Storage and shipping plans including details of handling and supporting of the bearings. Each bearing shipment shall be accompanied by a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The certificate shall state that the materials and fabrication involved comply in all respects to the specifications and data submitted in obtaining approval.
- E. Installation plans including the following:
  - 1. Method, materials, equipment, sequence, detailed procedures, and temporary support details that the Contractor proposes to use for installation of the spherical bushing bearing. The Contractor's proposed spherical bushing bearing installation including the solid shaft press fit shall not damage the lubricant at any given time during the installation. The Contractor's proposed spherical bushing bearing installation procedures and sequences shall be detailed in the superstructure construction sequences as specified in these special provisions.
  - 2. The Contractor's calculated relative distances for a) relative distance between the centerline of E2 floor beam at box girder (normal to vertical profile) and the centerline of Pier E2 (vertical); distance is measured in the longitudinal direction along the top horizontal surface of concrete crossbeam, and b) relative distance between centerline of longitudinal shear plates (normal to cross slope) and centerline of Pier E2 (vertical); distance is measured in the transverse direction along the top sloped surface of the concrete crossbeam.
- F. Details of lifting locations and mechanisms.

A supplement to the working drawings shall include the following:

- A. The quality control plan (QCP). The QCP of the spherical bushing bearings shall conform to the requirements in "Quality Control" of these special provisions and shall include descriptions, details, and procedures for the fabrication and installation of the spherical bushing bearings, except that the portion of the QCP for welding shall be submitted separately in conformance with "Welding" in these special provisions.
- B. The manufacturer of the spherical bushing bearing shall submit to the Engineer a manual for the bearing inspection, maintenance, and replacement. This manual shall include:
  - 1. A record of spherical bushing bearing for each component including the tracing of all components during the fabrication and installation of spherical bushing bearing.

- 2. Recommended life expectancy for each bearing component.
- 3. Recommended frequency for bearing inspection and maintenance schedule.
- 4. Procedures and details to perform the bearing inspection and maintenance.
- 5. List of indication of bearing defects and the associated repair methods, if applicable.
- 6. Procedures and sequences for bearing replacement including locations of temporary support, estimate of jacking load for each temporary support location, sequences and methods of detensioning anchor bolts, method of debonding between concrete and base plates and anchor bolts, method of removing and replacing bearings, a list of equipment to be used for bearing replacement, and traffic, safety, and environmental impact.

Each working drawing and calculation sheet shall be signed by an engineer who is registered as a Civil Engineer or Mechanical Engineer in the State of California. After complete working drawings and supplement are received by the Engineer, the Contractor shall allow the Engineer 40 days to review the submittal

Upon completion of installation, the Contractor shall submit to the Engineer certification stating that each spherical bushing bearing has been installed in accordance with the approved working drawings and supplements installation procedure.

#### MATERIALS

The materials specifications of spherical bushing bearing components shall conform to the following table:

Component	ASTM Specifications
Anchor Bolts	A354, Grade BD
Assembly Bolts	A240, Type 316
Bearing Plate	B22-C86300
Spherical Housing	A744, Grade CF-8M
Spherical Ball	B271-C86300
Solid Shaft	Structural Casting, Grade 550
Bearing Bottom Housing	Structural Casting, Grade 550
Bearing Top Housing	Structural Casting, Grade 345
Bearing Hold Down Assembly	Structural Casting, Grade 345

Attention is directed to "Welding" and "Audits" of these special provisions.

Attention is directed to "Lubricant and Test" of these special provisions.

Prestressing operation of anchor bolts shall conform to the requirements in "Prestressing Concrete," elsewhere in these special provisions.

High strength nonshrink grout shall conform to the requirements in "High Strength Nonshrink Grout," elsewhere in these special provisions.

Steel components including plates and anchor bolts shall conform to the details shown on the plans, the provisions in "Steel Structures," of the Standard Specifications, and these special provisions.

Clean and paint spherical bushing bearing shall conform to the requirements in "Clean and Paint Structural Steel (Seismic Joint, Spherical Bushing Bearing, and Shear Key)," of these special provisions.

The bronze alloy for the spherical ball and ring bushing shall be high strength manganese bronze centrifugally cast conforming to the requirements of ASTM Designation: B271-C86300. The stainless steel for the spherical housing shall be centrifugally cast conforming to the requirements of ASTM Designation: A744 Grade CF-8F. All items integral to and for the assembly of the bearing shall be stainless steel conforming to ASTM Designation: A 240, Type 304 or Type 316.

The bushing wall thickness, fits, and tolerances shall be as recommended by the manufacturer and specified in the working drawings and supplement.

#### QUALITY CONTROL

Quality Control (QC) shall be the responsibility of the Contractor. Quality Control shall be performed by an entity having a line of responsibility distinctly different from that of the manufacturer's fabrication department. As a minimum, the Contractor shall perform inspection and testing prior to fabrication, during fabrication, and after fabrication as specified herein and additionally as necessary to ensure that materials and workmanship conform to the requirements of the contract documents. Quality Control shall apply to each component of the spherical bushing bearing in addition to the assembly, shipping and installation of the bearing.

The QC Inspector shall be the duly designated person who acts for and on behalf of the Contractor for inspection, testing, and quality related matters for all fabrication.

Quality Assurance (QA) is the prerogative of the Engineer. The QA Inspector is the duly designated person who acts for and on behalf of the Engineer.

Each QC Inspector shall be responsible for quality control acceptance or rejection of materials and workmanship.

The Contractor shall provide sufficient number of QC Inspectors to ensure continuous inspection.

The Contractor shall designate in writing a Quality Control Manager (QCM). The QCM shall be responsible directly to the Contractor for the quality of the fabrication, including materials and workmanship, performed by the Contractor and subcontractors.

The QCM shall be the sole individual responsible to the Contractor for submitting and receiving all correspondences, required submittals, and reports to and from the Engineer.

The Contractor shall submit to the Engineer 3 copies of Quality Control Plan (QCP), in conformance with the requirements in "Working Drawings," of these special provisions. As a minimum, each QCP shall include the following:

- A. A manual including equipment, testing procedures, and code of safe practices.
- B. The names, qualifications, and documentation of certifications for the QCM and all QC Inspectors.
- C. An organizational chart showing all QC personnel and their assigned QC responsibilities.
- D. The methods and frequencies for performing all required quality control procedures, including QC inspection forms to be used, as required by the specifications including:
  - 1. All visual inspections.
  - 2. Tests.
  - 3. Calibration procedures and calibration frequency for all equipment.
- E. Forms to be used for Certificates of Compliance, monthly production logs, and monthly reports.
- F. Mill certificates and material certificates.
- G. Shipping plan.
- H. Installation plan.

Prior to submitting the QCP, a pre-fabrication meeting between the Engineer, Contractor, and fabricator, any entity performing spherical bushing bearing component fabrication or subcontractor to the Fabricator, shall be held to discuss the requirements for the QCP. The pre-fabrication meeting shall be held in San Francisco Bay Area.

After a complete QCP is submitted, the Contractor shall allow the Engineer 10 days to review the submittal. An amended QCP or addendum shall be submitted to, and approved in writing by the Engineer, for proposed revisions to the approved QCP. The Contractor shall allow the Engineer 10 days to complete the review of the amended QCP or addendum.

After final approval of the QCP, amended QCP, or addendum, the Contractor shall submit 7 copies to the Engineer of each of these approved documents.

It is expressly understood that the Engineer's approval of the Contractor's QCP shall not relieve the Contractor of any responsibility under the contract for the successful completion of the work in conformity with the requirements of the plans and specifications. The Engineer's approval shall not constitute a waiver of any requirement of the plans and specifications nor relieve the Contractor of any obligation thereunder, and defective work, materials, and equipment may be rejected notwithstanding approval of the QCP.

A monthly production log for fabrication shall be kept by the QCM for each day that fabrication is performed. The monthly report from each QC Inspector shall be included in the log.

The QCM shall sign and furnish to the Engineer, a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for each spherical bushing bearing. The certificate shall state that all of the materials and workmanship incorporated in the work, and all required tests and inspections of this work have been performed in conformance with the details shown on the plans and approved working drawings and the provisions of the Standard Specifications and these special provisions.

#### FABRICATION AND INSTALLATION

Attention is directed to "Steel Structures," of these special provisions for fabrication and installation of spherical bushing bearings at Pier E2. The Contractor shall also conform to the requirements specified herein.

Conformance with the requirements in SSPC-QP1, SSPC-QP2, and SSPC-QP3 of the "SSPC: The Society for Protective Coatings" will not be required for spherical bushing bearings.

Finish coats will not be required on the bearings.

Each bearing shall be marked for location and orientation in conformance with the approved working drawing and supplement. Bearings shall be secured to shipping skids in a manner that assures protection during transportation and off-loading. Each skid shall be wrapped in moisture proof and dust proof covers at all times until immediately before installation.

The retainer ring, boss plate, pin, and spacer pipe shall conform to ASTM Specifications as shown on the plans.

#### FABRICATION AND INSTALLATION

Attention is directed to Section, "Steel Structures," of these special provisions for fabrication and installation of tower cross bracing spherical bushing bearings. The Contractor shall also conform to the requirements specified herein.

The coefficient of friction for bearing lubricant shall be equal or less than 0.10.

Conformance with the requirements in SSPC-QP1, SSPC-QP2, and SSPC-QP3 of the "SSPC: The Society for Protective Coatings" will not be required for tower cross bracing spherical bushing bearings.

Finish coats will not be required on the bearings.

The Contractor shall provide the rubber covers to tower cross bracing spherical bushing bearings to seal the bearings with the details in the approved working drawings and supplement.

Each bearing shall be marked for location and orientation in conformance with the approved working drawing and supplement. Bearings shall be secured to shipping skids in a manner that assures protection during transportation and off-loading. Each skid shall be wrapped in moisture proof and dust proof covers at all times until immediately before installation.

Damaged bearings shall be replaced.

A qualified representative of the manufacturer shall be present during installation of all tower cross bracing spherical bushing bearings.

Full compensation for fabricating tower cross bracing spherical bushing bearing shall be considered as included in the contract prices paid per kilogram for furnish structural steel (bridge) (tower), and no separate payment will be made therefor.

Full compensation installing tower cross bracing spherical bushing bearing shall be considered as included in the contract prices paid per kilogram for erect structural steel (bridge) (tower), and no separate payment will be made therefor.

#### 10-1.50 SHEAR KEY (PIER E2)

This work shall consist of fabricating, testing, and installing the shear key on Pier E2 in conformance with details shown on the plans and the requirements of these special provisions.

The shear key consists of shear key housing with nut retainer assemblies, shear key stub, spherical ring with retainer brackets, spherical housing, bearing plates, shim plates, neoprene pads, dust cover, anchor bolts, high-strength bolts, and assembly bolts. The lubricant shall be self-lubricated and shall be provided for all bronze surfaces and other surfaces as shown on the plans. Shear keys shall be anchored in place with high strength non-shrink grout.

The shear key bushing consists of spherical ring, spherical housing, and bearing plates.

Shear keys shall be furnished and installed at Pier E2.

#### GENERAL

Attention is directed to "Steel Structures," of these special provisions for steel casting requirements.

Attention is directed to "Spherical Bushing Bearing (Pier E2)," of these special provisions for additional installation requirements.

The design loads, design rotations, design displacements, and alignment tolerances shall conform to the values shown on the plans.

#### WORKING DRAWINGS

The Contractor shall submit working drawings in conformance with the provisions in "Working Drawings," of these special provisions.

Working drawings shall include complete details, information, drawings, and substantiating calculations of the shear key and its components and the method, materials, equipment, and procedures of fabrication and installation that the Contractor proposes to use including the placement of high strength non-shrink grout.

Working drawing submittals shall include the following:

- A. Shear key fabrication plans including complete details for each component.
- B. All ASTM, AASHTO, or other material designations including dust cover and its connection to other shear key components.
- C. Storage and shipping plans including details of handling and supporting of the shear keys. Each shear key shipment shall be accompanied by a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The certificate shall state that the materials and fabrication involved comply in all respects to the specifications and data submitted in obtaining approval.
- D. Installation plans including the following:

- 1. Method, materials, equipment, sequence, detailed procedures, and temporary support details that the Contractor proposes to use for installation of the shear key. The Contractor's proposed shear key installation procedures and sequences shall be detailed in the superstructure construction sequences as specified elsewhere in these special provisions.
- 2. The Contractor's calculated relative distances for a) relative distance between the centerline of Pier E2 floor beam at box girder (normal to vertical profile) and the centerline of Pier E2 (vertical); distance is measured in the longitudinal direction along the top horizontal surface of concrete crossbeam, and b) relative distance between centerline of box girder (normal to cross slope) and centerline of Pier E2 (vertical); distance is measured in the transverse direction along the top sloped surface of the concrete crossbeam.
- E. Details of lifting locations and mechanisms.

A supplement to the working drawings shall include the following:

- A. The quality control plan (QCP). The QCP of the shear keys shall conform to the requirements in "Quality Control" of these special provisions and shall include descriptions, details, and procedures for the fabrication and installation of the shear keys, except that the portion of the QCP for welding shall be submitted separately in conformance with "Welding" of these special provisions.
- B. The Contractor shall submit to the Engineer a manual for the shear key inspection, maintenance, and replacement. This manual shall include:
  - 1. A record of shear key for each component including the tracing of all components during the fabrication and installation of shear key.
  - 2. Recommended life expectancy for each shear key component.
  - 3. Recommended frequency for shear key inspection and maintenance schedule.
  - 4. Procedures and details to perform the shear key inspection and maintenance.
  - 5. List of indication of shear key defects and the associated repair methods, if applicable.
  - 6. Procedures and sequences for shear key bushing replacement, a list of equipment to be used for shear key bushing replacement, and traffic, safety, and environmental impact.

Each working drawing and calculation sheet shall be signed by an engineer who is registered as a Civil Engineer or Mechanical Engineer in the State of California.

After complete working drawings and supplement are received by the Engineer, the Contractor shall allow the Engineer 40 days to review the submittal.

Upon completion of installation, the Contractor shall submit to the Engineer certification stating that each shear key has been installed in accordance with the approved working drawings and supplements installation procedure.

#### MATERIALS

The materials specifications of shear key components shall conform to the following table:

Component	ASTM Specifications
Shear Key Housing, Shear Key	Structural Casting, Grade 345
Stub, Spherical Ring	
Spherical Housing	High Strength Manganese
	Bronze Centrifugally Cast,
	B271-C86300
Anchor Bolts	A354, Grade BD
Assembly Bolts	A240, Type 316
High Strength Bolts	A 325M
Bearing Plate & Shim Plate	A 709M Grade 345

Attention is directed to "Welding" and "Steel Audits" of these special provisions.

Attention is directed to "Lubricant and Test" of these special provisions.

Prestressing operation of anchor bolts shall conform to the requirements in "Prestressing Concrete" of these special provisions.

High strength nonshrink grout shall conform to the requirements in "High Strength Nonshrink Grout" of these special provisions.

Steel components including plates and anchor bolts shall conform to the details shown on the plans, the provisions in "Steel Structures," of the Standard Specifications, and these special provisions.

Neoprene pads shall conform to Section 51-1.145, "Strip Waterstops," of the Standard Specifications and these special provisions. Neoprene pads shall have the following properties:

- A. Neoprene shall have a durometer hardness between 25-45
- B. The compressive strength shall not exceed 1000 kPa at 50% compression.

A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," shall be furnished to the Engineer certifying that the neoprene to be furnished conforms to the above provisions. The Certificate of Compliance shall be supported by a certified copy of the results of tests performed by the manufacturer on the neoprene pads.

Clean and paint shear key shall conform to the requirements in "Clean and Paint Structural Steel (Seismic Joint, Spherical Bushing Bearing, and Shear Key)," of these special provisions.

The bronze alloy for the spherical housing shall be high strength manganese bronze centrifugally cast conforming to the requirements of ASTM Designation: B271-C86300. The mating surfaces of the spherical ring and bearing plate shall be stainless steel weld overlay conforming to the requirements of ASTM Designation: A240 Type 316. All items integral to and for the assembly of the shear key bushing shall be stainless steel conforming to ASTM Designation: A 240, Type 304 or Type 316.

#### QUALITY CONTROL

Quality Control (QC) shall be the responsibility of the Contractor. Quality Control shall be performed by an entity having a line of responsibility distinctly different from that of the manufacturer's fabrication department. As a minimum, the Contractor shall perform inspection and testing prior to fabrication, during fabrication, and after fabrication as specified herein and additionally as necessary to ensure that materials and workmanship conform to the requirements of the contract documents. Quality Control shall apply to each component of the shear key in addition to the assembly, shipping and installation of the shear key.

The QC Inspector shall be the duly designated person who acts for and on behalf of the Contractor for inspection, testing, and quality related matters for all fabrication.

Quality Assurance (QA) is the prerogative of the Engineer. The QA Inspector is the duly designated person who acts for and on behalf of the Engineer.

Each QC Inspector shall be responsible for quality control acceptance or rejection of materials and workmanship.

The Contractor shall provide sufficient number of QC Inspectors to ensure continuous inspection.

The Contractor shall designate in writing a Quality Control Manager (QCM). The QCM shall be responsible directly to the Contractor for the quality of the fabrication, including materials and workmanship, performed by the Contractor and subcontractors.

The QCM shall be the sole individual responsible to the Contractor for submitting and receiving all correspondences, required submittals, and reports to and from the Engineer.

The Contractor shall submit to the Engineer 3 copies of Quality Control Plan (QCP), in conformance with the requirements in "Working Drawings," of these special provisions. As a minimum, each QCP shall include the following:

- A. A manual including equipment, testing procedures, and code of safe practices.
- B. The names, qualifications, and documentation of certifications for the QCM and all QC Inspectors.
- C. An organizational chart showing all QC personnel and their assigned QC responsibilities.
- D. The methods and frequencies for performing all required quality control procedures, including QC inspection forms to be used, as required by the specifications including:
  - 1. All visual inspections.
  - 2. Tests.
  - 3. Calibration procedures and calibration frequency for all equipment.
- E. Forms to be used for Certificates of Compliance, monthly production logs, and monthly reports.
- F. Mill certificates and material certificates.
- G. Shipping plan.
- H. Installation plan.

Prior to submitting the QCP, a pre-fabrication meeting between the Engineer, Contractor, and fabricator, any entity performing shear key component fabrication or subcontractor to the Fabricator, shall be held to discuss the requirements for the QCP. The pre-fabrication meeting shall be held in San Francisco Bay Area.

persons or entities hired by subcontractors who will provide other services or materials for the project, and shall have the following:

- A. A tensile testing machine capable of breaking the largest size of reinforcing bar to be tested.
- B. Operators who have received formal training for performing the testing requirements of ASTM Designation: A 970/A 970M.
- C. A record of annual calibration of testing equipment performed by an independent third party that has 1) standards that are traceable to the National Institute of Standards and Technology, and 2) a formal reporting procedure, including published test forms.

The Engineer shall be notified in writing when any lots of headed bar reinforcement are ready for testing. The notification shall include the number of lots to be tested and the location where the tests are to be conducted. After notification has been received, test samples will be randomly selected by the Engineer from each production lot of headed bar reinforcement which is ready for shipment to the jobsite. If epoxy coating is required, test samples will be taken after the headed bar reinforcement has been prepared for epoxy coating. The Engineer will be at the testing site within a maximum of one week after receiving written notification that the samples are at the testing site and ready for testing. In the event the Engineer fails to be present at the testing site within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by failure of the Engineer to be present at the testing site, the Contractor will be compensated for any resulting loss in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

A minimum of 3 samples from each production lot shall be tested. One tensile test shall be conducted on each sample.

Tensile tests shall conform to the requirements specified in ASTM Designation: A 970/A 970M, Section 7, except that at rupture, there shall be visible signs of necking in the reinforcing bar 1) at a minimum distance of one bar diameter away from the head to bar connection for friction welded headed bar reinforcement, or 2) outside the affected zone for integrally forged headed bar reinforcement.

The affected zone for integrally forged headed bar reinforcement is the portion of the reinforcing bar where any properties of the bar, including the physical, metallurgical, or material characteristics, have been altered during the manufacturing process.

If one of the test specimens fails to meet the specified requirements, one retest shall be performed on one additional sample, selected by the Engineer, from the same production lot. If the additional test specimen, or if more than one of the original test specimens fail to meet these requirements, all headed bar reinforcement in the lot represented by the tests will be rejected in conformance with the provisions in Section 6-1.04, "Defective Materials," of the Standard Specifications.

A Production Test Report for all testing performed on each lot shall be prepared by the independent testing laboratory and submitted to the Engineer as specified herein. The report shall be signed by an engineer who represents the laboratory and is registered as a Civil Engineer in the State of California. The report shall include the following information for each set: contract number, bridge number, lot number, bar size, type of headed bar reinforcement, physical conditions of test sample, any notable defects, limits of affected zone, location of visible necking area, and the ultimate strength of each headed bar.

Each unit of headed bar reinforcement in a production lot to be shipped to the site shall be tagged in a manner such that production lots can be accurately identified at the jobsite. All unidentified headed bar reinforcement received at the jobsite will be rejected.

#### MEASUREMENT AND PAYMENT

Full compensation for headed bar reinforcement shall be considered as included in the contract price paid per kilogram for bar reinforcing steel (bridge) and no separate payment will be made therefor.

Full compensation for epoxy-coated headed bar reinforcement shall be considered as included in the contract price paid per kilogram for bar reinforcing steel (epoxy-coated) (bridge) and no separate payment will be made therefor.

#### **10-1.59 STEEL STRUCTURES**

Construction of steel structures shall conform to the provisions in Section 55, "Steel Structures," of the Standard Specifications and these special provisions.

Fabricators and suppliers shall be certified under the AISC Quality Certification Program, Category Cbr, Major Steel Bridges, with endorsement F, Fracture Critical members, except that certification will not be required for fabrication of the tower strut façade and tower skirt. Alternatively, ISO 9001:2000 certification standard may be substituted for the AISC Quality Certification Program.

Details of box girder and crossbeam connections shall conform to the AASHTO Standard Specifications for Highway Bridges, unless otherwise shown on the plans.

Attention is directed to "Accelerated Working Drawings Submittal," of these special provisions.

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A. Minimum tension shall be verified using the "Pre-Installation Verification Turn-of-the-Nut Method," of the "Structural Bolting Handbook," published by the Steel Structures Technology Center, Incorporated, except that the required rotation shall be as given in Table 8.2. of this section and the required tension shall be as shown in the following table:

	Required Tension,	N*
Bolt Size, mm	A325M Bolts	A490M Bolts
M16	96 000	120 000
M20	149 000	188 000
M22	185 000	232 000
M24	215 000	270 000
M27	280 000	351 000
M30	342 000	428 000
M36	499 000	625 000
*The above values for design, actual install	are 5% higher than the rec ation and inspection, rounde	uired pretension values used ed to the nearest kN.

# **Pre-Installation Verification**

B. Rotational-capacity tests in accordance with the requirements in Section 11.5.6.4.2 "Rotational-Capacity Tests," of the AASHTO LRFD Bridge Construction Specifications, except that Table 11.5.6.4.1-2 "Nut Rotation from the Snug Condition," is replaced by Table 8.2. of this section.

Test results shall confirm both the minimum bolt tension and the rotational capacity of the bolts. If either test fails, the Contractor shall modify the nut rotation in Table 8.2. of this section until the requirements of both tests are satisfied. No adjustment in compensation will be allowed for modifications to the nut rotations as necessary to satisfy test requirements. Revisions to Table 8.2. shall be approved by the Engineer prior to bolting operations.

The Engineer will randomly sample and perform quality assurance testing of high strength fasteners. Samples will be obtained at locations chosen by the Engineer. The Contractor shall provide the number of bolts specified below to the Engineer for quality assurance testing:

Bolt Sampling S	Size
Lot Size	Sample Size
(No. of Bolts)	(No. of Bolts)
2 to 15	3
16 to 25	4
26 to 50	5
51 to 90	7
91 to 150	8
151 to 280	9
281 to 10,000	12
10,001 to 500,000	16
500,001 and over	20

Bolt	Samp	ling	Size
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Steel fasteners, designated on the plans as A 354, Grade BC, and A 354, Grade BD, shall conform to the requirements of ASTM Designation: A 354. Steel fastener components for steel fasteners designated as A 354 shall include a bolt, nut and hardened washer. Nuts for steel fasteners designated as A 354 shall conform to Section 55-2.01, "Description," of the Standard Specifications.

Steel fasteners designated on the plans as A 354, Grade BD shall be dry blast cleaned in accordance with the provisions of Surface Preparation Specification No. 10, "Near White Blast Cleaning," of the "SSPC: The Society for Protective Coatings.

Steel fasteners designated on the plans as A 354, Grade BC, and A 354, Grade BD, shall be galvanized in accordance with the requirements in Section 75-1.05, "Galvanizing," of the Standard Specifications and shall conform to the requirements in ASTM Designation: A123 for bolts and ASTM Designation: A153 for nuts and hardware. Steel fastener assemblies designated as A354, Grade BD, shall be galvanized within 4 hours of being dry blast cleaned.

# The Contractor shall submit certified test reports showing that the A 354, Grade BD fasteners conform to the provisions in ASTM Designation: A 143.

Steel fasteners, designated on the plans as A 354, Grade BC, and A 354, Grade BD, shall conform to the requirements of ASTM Designation: A 354. Steel fastener components for steel fasteners designated as A 354 shall include a bolt, nut and hardened washer. Nuts for steel fasteners designated as A 354 shall conform to Section 55-2.01, "Description," of the Standard Specifications. Nuts shall be zinc coated and be furnished with a dry lubricant conforming to Supplementary Requirement S1 and S2 in ASTM Designation: A 563.

Steel fasteners designated on the plans as A 354, Grade BD shall be tensioned not less than the value shown on the plans. Prior to installation, the Contractor shall submit to the Engineer for approval the methods and equipment to be used to tension steel fasteners designated as A354, Grade BD in accordance with Section 55-1.02, "Drawings," of the Standard Specifications. Working drawings shall include methods and equipment to be used to evaluate: 1) the presence of a lubricant, 2) the efficiency of the lubricant, and 3) the compatibility of the high strength steel bolt, nut and hardened washer.

Except where sub-punching is permitted, bolt holes shall be drilled or reamed, unless otherwise shown on the plans.

#### Punching

The first paragraph of Section 55-3.14A(1) "Punching," of the Standard Specifications shall not apply.

Punching or sub-punching of Grade 250 structural steel where the material is thicker than 16 mm will not be permitted. Punching or sub-punching of high-strength structural steel where the material is thicker than 12 mm will not be permitted.

#### **Prestressing High-Strength Bolts**

High-strength A354 bolts shall be tensioned by means of hydraulic jacks so that the force in the bolts shall not be less than the value shown on the plans.

The maximum temporary tensile stress (jacking stress) in high-strength bolts shall not exceed 75 percent of the specified minimum ultimate tensile strength of the material. Prestressing forces in high-strength bolts shall consider all losses, including creep of steel, losses due to sequence of stressing, and other losses specific to the method or system of prestressing used by the Contractor.

Hydraulic jacks used for prestressing high-strength bolts shall be calibrated in accordance with the requirements in Section 50-1.08, "Prestressing," of the Standard Specifications.

Final prestressing high strength A354 bolts at the tower anchorage shall be performed after the full dead load is transferred to the cable system.

#### ASSEMBLY

The method of erection of the suspended structure and tower shall be determined by the Contractor to meet the seismic design load criteria and ensure control of box girder and tower deflections due to wind induced oscillations.

The Contractor shall carry out the necessary structural analyses for the erection procedure to demonstrate the adequacy of the procedure. Details of these analyses and of any supplementary damping or other measures shall be submitted to the Engineer for review and approval.

Wind pressure effects during erection shall be calculated using a gust wind appropriate to a return period of not less than 25 years and shall allow for variation of speed with height per ANSI ASCE 7-95. The 25-year wind corresponds to a 77 mph one-hour average wind speed (and a corresponding 3-second gust wind speed of 100 mph) at deck elevation of 50 meters, as well as a critical flutter wind speed threshold of 112 mph based on a 1000-year return period. The Contractor shall provide temporary connections between adjacent lift sections in order to ensure sufficient torsional stiffness of the suspended structure. The Contractor shall also provide the proper support of the suspended structure during all stages of erection. The Contractor shall similarly ensure control of tower deflections due to wind-induced oscillations at all stages of erection and shall provide holdback stays or other damping devices as necessary. All such temporary measures shall be approved by the Engineer.

Wind design loads may be reduced during lifting operations.

Seismic loading during erection shall conform to the seismic loading requirements specified in "TEMPORARY TOWERS," subsection "TEMPORARY TOWER DESIGN," subsection "Seismic Design Loads," of these special provisions.

The erection procedure shall be such that the maximum stresses in any part of the permanent structure do not cause any permanent deformation or damage. Appropriate values of loads and safety factors for erection loading conditions shall be submitted by the Contractor to the Engineer for review and approval.

The details of any fastenings which the Contractor may require in any part of the permanent works for erection, and the procedure for their removal, shall be submitted to the Engineer for approval.

#### Tower

Tower lifts shall be in lengths as indicated on the plans. Exterior plates of the tower shafts shall be fabricated with direction of rolling aligned along the vertical direction of the tower. Within each lift, the number of transverse splices of the Contract No. 04-0120F4





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**ELEVATION** (Looking East)

#### BEARING ASSEMBLY TABLE

			Number of		Des	ign Load	) (kN per	bearing)			De	esign	roto	ation	(radic	ins)	D	esign	Disp	laceme	nt (mn	n)	Install Misalianment																			
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SHEAR KEY ASSEMBLY TABLE

\* Seismic load factor x = 1.0 (For shear key engaged load condition, x = 1.4).
\*\* For uplifting only.

Location	Number of Shear Key Units Per Location	Design Load (kN per shear key)					Design rotation (radians)						Design Displacement (mm)						
		Number of Shear Key Units Service			Ultimate			Service			Ultimate			Service			Ultimate		
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"E" Line	I	9000	4500	0	42500	35000	0	0.009	0	0	0.130	0.130	0.130	0	0	10	0	0	20
Crossbeam	2	9000		0	42500	0	0	0.009	0	0	0.130	0.130	0.130	0	5	10	0	20	20

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 Offset value is shown for information only. The Contractor shall calculate the offset and verify it in the field before placing the bearings and shear key.

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- 4. The Contractor shall submit the construction sequence of the shear key and bearings based on his ways and means for the Engineer's approval.
- 5. For floor beam E2, see "Girder at Pier E2" sheets.
- 6. For longitudinal shear plate, see "Girder at East Transition No.I" sheet.
- 7. Box girder work point is on the finished profile grade which is the top of 50 mm overlay.
- 8. At the Contractor's option, small holes may be drilled through the bearings and shear keys for use with a laser alignment method. All holes shall be plugged with tapped screws after bearing and shear key installation.
- 9. The center of rotation CR shall be a straight line through the pin center of all four bearings, and perpendicular to the bridge axis direction.

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## POST-TENSIONING CHARACTERISTICS ASSUMED FOR DESIGN

I. Prestressing strand

	Friction curvature coefficient	8	0.20
	Friction wobble coefficient	0	0.0007/m
	Anchor set	8	6 mm
2.	Prestressing monostrand (Tie-down cable	es	only)
	Friction curvature coefficient	8	N/A
	Friction wobble coefficient	8	0.0007/m
	Anchor set	8	6 mm
3.	High strength rods (where applicable)		
	Friction curvature coefficient	0	0.25
	Friction wobble coefficient	8	0.0007/m
	Anchor set	:	2 mm
4.	High strength PT rod (75 mm)		
	Friction curvature coefficient	:	0.25
	Friction wobble coefficient		0.0012/m
	Anchor set	:	2 mm

- 5. Prestressing strands shall conform to ASTM A416, low relaxation, 7-wire strands, with guaranteed minimum ultimate strength of 1860 MPa.
- 6. Prestressing monostrands ((Tie-down cables only)) shall conform to ASTM A416, low relaxation, 7-wire strands, with guaranteed minimum ultimate strength of 1860 MPa.
- 7. High strength rods (ASTM A354 Grade BD) shall have a guaranteed minimum ultimate strength of 965 MPa.
- 8. High strength rods (ASTM A354 Grade BC) shall have a guaranteed minimum ultimate strength of 793 MPa.
- 9. High strength rods (ASTM A722) shall have a guaranteed minimum ultimate strength of 1030 MPa.
- 10. High strength PT rods (75 mm) shall have a guaranteed minimum ultimate strength of 1030 MPa.

## PRETENSIONING/GROUTING SEQUENCE

- I. The pretensioning and grouting sequence of the Pier W2 prestressing strand tendons and of the Pier W2 high strength anchor rods (anchor bolts) shall be included with the Contractor's erection plan. The Contractor shall submit the erection plan along with the pretensioning and grouting sequence to the Engineer for review and approval.
- 2. The pretensioning and grouting sequence of the Pier TI (Tower) high strength anchor rods (anchor bolts) shall be included with the Contractor's erection plan. The Contractor shall submit the erection plan along with the pretensioning and grouting sequence to the Engineer for review and approval.
- 3. The pretensioning and grouting sequence of the Pier E2 prestressing strand tendons and of the Pier E2 Bearing and Pier E2 Shear Key high strength anchor rods (anchor bolts) shall be included with the Contractor's erection plan. The Contractor shall submit the erection plan along with the pretensioning and grouting sequence to the Engineer for review and approval.

## STRESSING FORCE LIMITS

- I. All high strength anchor rods (anchor bolts) shall be pretensi to 70% of their ultimate tensile strength, unless noted otherw
- 2. Force in all permanent high strength prestressing tendons shall of the guaranteed minimum ultimate strength of the tendon afte
- 3. Force in all permanent high strength rods (anchor bolts) shall of the guaranteed minimum ultimate strength of the bar after s

## CONCRETE

凵 I. A minimum compressive strenath of 36 MPa (f'ci) shall be attained in the concrete of Pier W2 and Pier E2 crossbeams prior to stressing.

## HIGH STRENGTH NONSHRINK GROUT

I. All high strength nonshrink grout shall attain a minimum compressive strength of f'ci=75% f'c (MPa) prior to being subjected to subsequent loading and before pretensionina operations.

## PT DUCTS

- I. Ducts for prestressing strand tendons and high strength rods (anchor bolts) shall consist of galvanized corrugated steel ducts, unless noted otherwise.
- 2. Prebent ducts shall be used for prestressing tendons with radius less than 10 m.
- 3. Prestressing strand tendon suppliers shall provide and use extra strong steel pipes (ASTM A53 Type S, Grade B (fy = 240 MPa) and necessary hardware connecting the steel pipes to galvanized corrugated steel ducts where radius of PT ducts is less than 5000 mm.
- // 4. Based on the Contractor's stressing sequence, local strengthening of PT ducts (e.g. extra strong steel pipes) at critical location's may be required.

## GROUT FOR PT DUCTS/PIPE SLEEVES



- I. Tie-down cables with monostrands shall not be grouted.
- 2. Ducts shall be grouted with nonshrink grout (f'c=60 MPa).
- 3. Nonshrink grout shall attain a strength of 36 MPa (f'ci) minimum before being subjected to stresses due t subsegent loading.



- BLOCKOUT CONCRETE
- I. After completion of all pretensioning and grouting operations, closure reinforcement shall be bent into place over the anchor blockouts are filled with concrete (f'c=60 MPa).

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Flex your power Be energy efficient!

June 06, 2007

Contract No. 04-0120F4 04-SF-80-13.2 / 13.9 Self-Anchored Suspension Bridge Letter No. 05.03.01-000296

Michael Flowers Project Executive American Bridge/Fluor Enterprises, a JV 375 Burma Road Oakland, CA 94607

Dear Michael Flowers,

#### Submittal 136 - MFSQA for Tensile Testing Metallurgical Laboratory

The Department has reviewed submittal ABF-SUB-00136, "MFSQA for Tensile Testing Metallurgical Laboratory," dated May 23, 2007. This submittal is Approved and upon receipt and approval of the MFSQA documents for the remaining Dyson subcontractors, the Contractor may schedule a Department audit as required by Special Provisions, Section 8-4, "Audits."

If you have any further questions please contact Dr. Mazen Wahbeh at (818) 292-0659.

Sincerely,

Jusel

GARY PURSELL Resident Engineer

cc: Rick Morrow file: 05.03.0, 55.0136



August 24, 2007

Contract No. 04-0120F4 04-SF-80-13.2 / 13.9 Self-Anchored Suspension Bridge Letter No. 05.03.01-000487

Michael Flowers Project Executive American Bridge/Fluor Enterprises, a JV 375 Burma Road Oakland, CA 94607

Dear Michael Flowers,

## **Department Audit of Dyson Corporation**

The Department has reviewed ABF letter 257, dated August 14, 2007, and the "Corrective Action Request" from the Dyson Corporation, dated August 09, 2007. Based upon the information provided and in accordance with Special Provisions section 8-4, "Audits," the Dyson Corporation receives a "Pass" for the Department audit. This "Pass" applies only to the Dyson Corporation. Suppliers and subcontractors to the Dyson Corporation are subject to separate MFSQA reviews and audits. The following table summarizes the current status of associated audits:

Company	Letter No.	Date of Notice	MFSQA	AUDIT
AAA Galvanizing	321	06-18-2007	Approved	
	336	06-22-2007	Approved	
Art Galvanizing	403	07-25-2007		Contingent Pass
	320	06-18-2007	Approved	
Central Testing Lab	413	07-26-2007		Fail
Custom Industrial Processing	325	06-18-2007	Not Approved	
Industrial Coatings Inc	444	08-06-2007	Approved	
	361	07-05-2007	Approved	
Mechanical Galv-Plating Corp	432	08-02-2007		Pass
	337	06-22-2007	Approved	
North American Galvanizing	421	07-31-2007		Fail
	297	06-06-2007	Approved	
Stork Herron Testing Lab	417	07-30-2007		Contingent Pass
TC Industries	367	07-09-2007	Approved	
	296	06-06-2007	Approved	
Tensile Testing Metallurgical Lab	409	07-26-2007		Pass
Universal Galvanizing	338	06-25-2007	Approved	

American Bridge/Fluor Enterprises, a JV August 24, 2007 Page 2 of 2

The Contractor is reminded that work may not proceed at the facilities receiving a "Contingent Pass," until the outstanding issues detailed in the Department's letters have been addressed.

If you have any further questions, please contact Gary Lai at the Working Drawing Campus.

Sincerely,

Dusell

GARY PURSELL Resident Engineer

cc: Rick Morrow Mazen Wahbeh

file: 05.03.01, 55.0097



Flex your power Be energy efficient!

October 18, 2007

Contract No. 04-0120F4 04-SF-80-13.2 / 13.9 Self-Anchored Suspension Bridge Letter No. 05.03.01-000706

Michael Flowers Project Executive American Bridge/Fluor Enterprises, a JV 375 Burma Road Oakland, CA 94607

Dear Michael Flowers,

## **Department Audit - Art Galvanizing Works**

The Department is in receipt of ABF-CAL-LTR-000271, dated August 29, 2007, responding to the Department's review of Submittal ABF-SUB-000160R00, MFSQA for Art Galvanizing Works. Based upon the information provided, Art Galvanizing Works is receiving a Pass. The following issues must be satisfactorily addressed in writing prior to the start of fabrication:

- 1. The previous response to MFSQA response R6 indicated positively that there is a separation between Quality Control and Production. Currently, the same individual is managing both Production and Quality Control. Please confirm whether or not a third party will be used for Quality Control.
- 2. Regarding the Observations:
  - a. **Observation 1:** This matter is closed as it does not relate directly to production.
  - b. **Observation 2:** This matter is closed. The Department notes and accepts the Contractor's explanation.
  - c. **Observation 3:** This item was meant to convey that Art Galvanizing Works did not have facilities to handle blasting independently. Maximum capacity is 3 feet in length, while rods for this Contract are up to 15 feet long. The Department notes and accepts the Contractor's explanation. This matter will be closed pending submission of procedures detailing the blasting and inspection of the material.
  - d. **Observation 4-8:** These issues can be resolved by addressing the previous comment regarding the separation between Quality Control and Production.

American Bridge/Fluor Enterprises, a JV October 18, 2007 Page 2 of 2

The Department requests that notification be provided prior to the start of any work at this facility for this Contract.

If you have further questions, please contact Dr. Venkatesh Iyer at 858.967.6363.

Sincerely,

Pussell

GARY PURSELL Resident Engineer

cc: Rick Morrow, Brian Boal, Mazen Wahbeh, Vankatesh Iyer file: 05.03.01, 55.0160



July 01, 2008

Contract No. 04-0120F4 04-SF-80-13.2 / 13.9 Self-Anchored Suspension Bridge Letter No. 05.03.01-002312

Michael Flowers Project Executive American Bridge/Fluor, A JV 375 Burma Road Oakland, CA 94607

Dear Michael Flowers,

## Submittal 183, Rev. 1 - MFSQA for TC Industries (Response to Audit Contingencies)

The Department has completed the review of Submittal ABF-SUB-000183R01, "MFSQA for TC Industries, a subcontractor to The Dyson Corporation," dated June 20, 2008, which contains the response to the audit contingencies in State Letter 05.03.01-001379. The submittal is "Approved," and TC Industries is receiving a Pass.

It is acceptable for TC Industries to perform heat treatment services for The Dyson Corporation. The Contractor was verbally notified earlier on July 1, 2008 of the acceptable response to the audit contingencies.

If you have any questions, please contact Ryan Smith at (858) 232-6799.

Sincerely,

### <<< ORIGINAL SIGNED >>>

GARY PURSELL Resident Engineer

cc: Rick Morrow, Brian Boal, Gary Lai, Ryan Smith file: 05.03.01, 55.0183



July 09, 2008

Contract No. 04-0120F4 04-SF-80-13.2 / 13.9 Self-Anchored Suspension Bridge Letter No. 05.03.01-002346

Michael Flowers Project Executive American Bridge/Fluor, A JV 375 Burma Road Oakland, CA 94607

Dear Michael Flowers,

#### Submittal 674, Rev. 1 - Monnig MFSQA (Response to Audit Contingencies)

The Department has completed review of Submittal ABF-SUB-000674R01, "Monnig MFSQA," dated June 25, 2008, which contains the response to the audit contingencies in State Letter 05.03.01-002100. The submittal is "Approved," and Monnig Industries and Phoenix Manufacturing are receiving a Pass. It is acceptable for Monnig Industries to perform hot dip galvanizing of threaded anchor rods, with Phoenix Manufacturing performing abrasive blasting.

If you have any questions, please contact Dr. Venkatesh Iyer at (858) 967-6363.

Sincerely,

#### 

GARY PURSELL Resident Engineer

cc: Rick Morrow Brian Boal Gary Lai Venkatesh Iyer file: 05.03.01, 55.0674



February 13, 2009

Contract No. 04-0120F4 04-SF-80-13.2 / 13.9 Self-Anchored Suspension Bridge Letter No. 05.03.01-003482

Michael Flowers Project Executive American Bridge/Fluor, A JV 375 Burma Road Oakland, CA 94607

Dear Michael Flowers,

## Submittal 135, Rev. 4 - MFSQA for Stork Herron Testing Laboratory (STHL)

The Department has completed review of Submittal ABF-SUB-000135R04, "Manufacturing and Fabrication Self Qualification Audit (MFSQA) – Stork Herron Testing Laboratory," dated February 13, 2009. The submittal is "Approved," and accordingly, Mr. Shane Levermann may perform NDT (MT) on the Project for the Dyson Corporation.

If you have any questions, please contact Mohammad Fatemi (916) 813-3677.

Sincerely,

<<< ORIGINAL SIGNED >>>

GARY PURSELL Resident Engineer

cc: Rick Morrow Brian Boal Gary Lai Mohammad Fatemi file: 05.03.01, 55.0135



375 Burma Road Oakland, CA 94607 USA Phone (510) 808-4600 Fax (510) 808-4601

# SAN FRANCISCO OAKLAND BAY BRIDGE EAST SPAN SEISMIC SAFETY PROJECT

## SELF-ANCHORED SUSPENSION BRIDGE (Superstructure and Tower)

Caltrans Contract No. 04-0120F4 Bridge No. 34-0006L/R District 04 County SF Route 80 Kilometer Post 13.2 / 13.9

> Submittal ABF- SUB-000689R01: E2 Shear Key Embedded Anchor Rod Assemblies

> > Baseline Schedule Activity ID: N/A

Prepared By: American Bridge / Fluor Enterprises Inc., A Joint Venture

Date: May 14, 2008 Revision 1

## **TABLE OF CONTENTS**

## 

ABF Building San Francisco Bay's New Signature Suspension Bridge







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DEPARTMENT OF TRANSPORTATION - District 4 Toll Bridge Program 333 Burma Rd. Oakland, CA 94607 (510) 622-5660, (510) 286-0550 fax



Flex your power Be energy efficient!

July 14, 2008

Contract No. 04-0120F4 04-SF-80-13.2 / 13.9 Self-Anchored Suspension Bridge Letter No. 05.03.01-002360

Michael Flowers Project Executive American Bridge/Fluor, A JV 375 Burma Road Oakland, CA 94607

Dear Michael Flowers,

# **Quality Assurance Testing of Externally Threaded Fasteners**

This letter is issued in response to renewed discussions at the Working Drawing Campus (WDC) and ABF-RFI-001233R04, concerning the Quality Assurance (QA) testing regimen of externally threaded fasteners, nuts and washers (fastener assemblies) for the SAS Project.

Initial discussions concerning the QA sampling requirements took place at the WDC in June 2007 and predominately concentrated on the QA sampling quantity for specialized and large diameter fastener assemblies used on the Cable System and the E2 Bearing and Shear Keys. A spreadsheet quantifying the sample size was provided at that time in draft format for discussion purposes only.

In addition, the Contractor was reminded at these meetings that QA testing of fastener assemblies will be performed pursuant to Standard Specification Section 6-1.01, "Source of Supply and Quality of Materials," and that the sample quantity, per heat, will be in accordance with Contract Special Provision Section 10-1.59, "Steel Structures," subsection "Bolted Connections," as shown below:

Lot Size	Sample Size
(No. of Bolts)	(No. of Bolts)
2 to 15	3
16 to 25	4
26 to 50	5
51 to 90	7
91 to 150	8
151 to 280	9
281 to 10,000	12
10,001 to 500,000	16
500,001 and over	20

AMERICAN BRIDGE/FLUOR, A JV July 14, 2008 Page 2 of 2

The spreadsheet attached to this letter titled "*QA Sampling – Cable System/E2 Bearings & Shear Keys*," modifies the sample size provided above for some of the Cable System and E2 Bearing and Shear Key fastener assemblies. Please provide test samples in accordance with the attachment.

Please contact Brian Boal at (510) 622-5191 should you have any questions.

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Sincerely,

hund

GARY PURSELL Resident Engineer

Attachment

cc: Rick Morrow Brian Boal Mark Woods Gary Lai Venkatesh Iyer Ryan Smith file: 05.03.01

"Caltrans improves mobility across California"

# QA Sampling - Cable System/E2 Bearings & Shear Keys

In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished it is a supported it is the contractor of the second structure of the second sec		-	T.B.D. by ABF	274	HD Galv	A354 BD	r 90mm dia x ###	Main Cable Anchoi Rods
In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished items may be furnished.		~	T.B.D. by ABF	224	HD Galv	A354 BD	50mm dia x ***	E2 Bearing
In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished items may be furnished.		-	T.B.D. by ABF	96	HD Galv	A354 BD	76mm dia x ***	E2 Bearing
In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished items may be furnished.		-	T.B.D. by ABF	336	HD Galv	A354 BD	76mm dia x ***	E2 Shear Key
In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished it is the contractor's option.		1	T.B.D. by ABF	192	HD Galv	A354 BD	76mm dia x ***	E2 Shear Key
	Included with Type I Suspender	Included with Type I Suspender	T.B.D. by ABF	16	HD Galv	A354 BC	90mm dia x ***	Tower Suspender Anchor Rod
In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished items may be furnished.		1	T.B.D. by ABF	48	HD Galv	A354 BC	100mm dia x ***	Suspender Socket Anchor Rods - Type II
In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished is the contractor's option, 3 full size furnished.		L .	T.B.D. by ABF	352	HD Galv	A354 BC	90mm dia x ***	Suspender Socket Anchor Rods - Type I
In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished is a set of the contractor items may be furnished.		L	T.B.D. by ABF	8	HD Galv	A354 BC	: 1.5" dia x ***	Jacking Saddle Tie Rods
In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished in the contractor's option, 3 full size furnished.		L .	T.B.D. by ABF	168	HD Galv	A354 BC	50mm dia x ***	West Deviation Saddle Anchor Rods
In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished in all cases, three (3) samples per heat are required.		L	T.B.D. by ABF	42	HD Galv	A354 BC	1.75" dia x ***	West Deviation Saddle Tie Rods
In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished in all cases, three (3) samples per heat are required.		L	T.B.D. by ABF	32	HD Galv	A354 BD	50mm dia x ***	East Saddle Anchor Rods
In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished is the Contractor's option, 3 full size furnished.		L	T.B.D. by ABF	18	HD Galv	A354 BD	3" dia x ***	East Saddle Tie Rods
In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished items may be furnished.		1	T.B.D. by ABF	24	HD Galv	A354 BD	4" dia x ###	Tower Saddle Tie Rods
In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished is the Contractor's option, 3 full size furnished.		L	T.B.D. by ABF	24	HD Galv	A354 BD	75mm dia x ###	Cable Band Anchor Rods
	)	1	T.B.D. by ABF	48	HD Galv	A354 BC	51mm dia x 710	Cable Band Bolts
30 Bolts are required in addition to those listed in the table pe Section 10-1.60 "Cable System," for tensile testing & load extension curves	)	9	50	1260	HD Galv	A354 BC	51mm dia x 610	Cable Band Bolts
	Material sample quantities to be sent to Translat	Bolt/Rod quantities to be sent to Translab						
Comments	Material Only (Notes 10 & 13)	Finished Item (Notes 10, 11, 12)	Spare Fasteners	Dwg Quantity Required	Coating	Material & Grade	Size	Description

1) Quantities for testing are per Lot. (Lot implies same diameter, length, heat, as well as heat treatment batch)
2) The number of samples indicated will be for Caltrans Lab testing.
3) Quantities listed do not take into account re-testing criteria due to failure
4) #This list is NOT all inclusive. Items not listed are to follow the sampling size table in Section 10-1.59 "Steel Stuctures" of the Contract Special Provisions
5) ### = Fastener length varies; length to be determined by ABF's Means & Methods
6) A354 requires that the number of fests conform to ASTM F1470 and performed in accordance with ASTM F606
8) Number of tests/requirements for ASTM F1470 not shown
1) Countities assume that no ROAPP testing required.
1) Quantities assume that no ROAPP testing required.
1) Quantities and that the number of tests conform to ASTM F1470 and performed in accordance with ASTM F606
8) Number of tests/requirements for ASTM F1470 not shown
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1) Quantities assume that no ROAPP testing required.
1) Guantities assume that no ROAPP testing required.
1) Guantities assume that no ROAPP testing required.
1) Finished Item sample shall not clace on at random, and the fabricator may send to Trans Lab either this sample OR a 1200 mm length cut from a threaded end of the sample.
1) Finished Item sample shall include the same number of washers, nuts, or similar components that will accompany an item's field installation.
2) Each Finished Item sample shall include the same number of washers, nuts, or similar components that will accompany an item's field installation.
3) Material Only' denotes a sample 300 mm in length (minimum) which need or the tabricator may send to stock/heat treatment lots as the finished product.

Attachment: State Letter 05.03.01-002360 - 14th July 2008

Notes/Legend:



	CERTIFIED MATERIAL	TEST REPORT	CODE NC	J10
CUSTOMER ORDER NUMBER	CUSTOMER PART NUMBER	HEAT NUMBER M32854	work order NUMBER 228544 101	DATE 7/13/09
REPORT TO QUALITY ASSURAN THE DYSON CORPO	CE RATION	SHIP TO JOS. DYSON &	SONS INC.	
53 FREEDOM RD.		53 FREEDOM RI	D.	
PAINESVILLE , OF	H 44077	PAINESVILLE	, OH 44077	
	ORDEREI	D		
GRADE 4140	size 3."		<i>LENGTH</i> 22'73/4"	
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0.010 0.0006 0.	003			
GRAIN SIZE	SPECIFICATION ASTM E112	FINE GRAIN	5-8	
HARDNESS	SPECIFICATION ASTM E10	AFTER HT T	REAT	
SURFACE HARDNESS	(HRC)		· , •	
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hris Easler

Ouality/Assurance Representative

	CERTIFIED MATERIAL	TEST REPORT	CODE NCJ10
CUSTOMER ORDER NUMBER	CUSTOMER PART NUMBER	HEAT NUMBER M32854	work order number DATE 228544 101 7/13/09
QUALITY ASSURANCE THE DYSON CORPOR	EATION	SHIP TO JOS. DYSON &	SONS INC.
53 FREEDOM RD.		53 FREEDOM R	D.
PAINESVILLE , OH	44077	PAINESVILLE	, OH 44077
GRADE	SIZE	, 	LENGTH
4140	3."	TIONS	22' 7 3/4"
ASTM A354-07 GRADE	BD; Q&T (AIM FOR 35-3	7 ROCKWELL C)	
HARDENABILITY	SPECIFICATION ASTM A255	/A304	
THEORETICAL J1 2 3 4 5 58 58 58 58 58 58 5	6 7 8 9 10 11 12 13 3 8 58 56 55 53 51 4	14 15 16 18 20 2 49 47 46 46	22 24 26 28 30 32 34 44 41 39
PHYSICALS	SPECIFICATION ASTM E8/A	370 AFTER HT	TREAT
	2.0	IN	
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PAGE 2		in ance with specified ro	eguirements

Gerdau MacSteel Monioe 3000 East Front Street

Monroe, MI 48161



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Sector Quality Assurance, Representative 154 (1):22

	CERTIFIED MATERIAL	TEST REPO	DRT	CODE NCJ	510
CUSTOMER ORDER NUMBER 66015	CUSTOMER PART NUMBER	неат МЗ 2	<i>пимвек</i> 854	WORK ORDER NUMBER	DATE 7/13/09
	F		SHIP TO	le.	
THE DYSON CORPOR	ATION	JOS.	DYSON &	SONS INC.	
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TEMPERATURES	DURING PROCESSING OR W	HILE IN (	DUR POSS	Q.A. REVIEWED DATE 72007	
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Gerdau MacSteel Monfoe 3000 East Front/Streel Monroe, MI 48.161

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		TET DEPORT	CODE NO	J12
	CERTIFIED MATERIAL	HEAT NUMBER	WORK ORDER NUMBER	DATE
CUSTOMER ORDER NUMBER	CUSTOMER PART NUMBER	M32854	228544 101	1/13/05
6015				
		SHIP IC		
OUALITY ASSURAN	ICE	JOS. DYSON &	SONS INC.	
THE DYSON CORPO	ORATION			
TO TREEDOM RD		53 FREEDOM F		
53 FREEDOM NO.		PAINESVILLE	, OH 44077	9
PAINESVILLE , C	OH 44077			
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GRADE	SIZE		22' 7 3/4"	
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ASTM A354-07 GAA				
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BATCH 2 - 32	(119  bars)			
BATCH 3 - 35	(10  bars)		÷	
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	CERTIFIED MATERIAL	TEST REPORT	CODE NO	512
CUSTOMER ORDER NUMBER	CUSTOMER PART NUMBER	HEAT NUMBER M32854	WORK ORDER NUMBER	DATE 7/13/09
QUALITY ASSURANCE THE DYSON CORPORA	ATION	JOS. DYSON &	SONS INC.	
53 FREEDOM RD.		53 FREEDOM R	D.	
PAINESVILLE , OH	44077	PAINESVILLE	, OH 44077	
	ORDEREI	)		
GRADE	SIZE		LENGTH 22' 7 3/4"	
4140	CUSTOMER SPECIFICA	TONS	en e	
ASTM A354-07 GRADE	BD; Q&T (AIM FOR 35-3	7 ROCKWELL C)		
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PHYSICALS	PECIFICATION ASTM E8/A	370 AFTER HT	TREAT	š :
	2.0	IN		ran -
TENSILE (KSI) Y	IELD (KSI) & ELONGA'	FION REDUCTION	ON OF AREA	
Tensile( BATCH 1 - 157.8 BATCH 2 - 155.6 BATCH 3 - 158.2 BATCH 4 - 153.0	KSI) YIELD ELONGAT 136.1 16 133.1 17 137.7 14 133.0 14.8	ION R0A 47 (100 ) 53 (119 ) 40 (40 ba 44 (10 ba	oars) oars) ars) ars)	
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和此合为进口实现。CDI和IDAO系及自由在自由自由主要可以用的

Gerdau MacSteel Monroe 3000 East Front Street A

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Monroe MI 48



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	CERTIFIED MATERIAL	TEST REPORT	CODENCE	512
CUSTOMER ORDER NUMBER	CUSTOMER PART NUMBER	HEAT NUMBER M32854	WORK ORDER NUMBER	DATE 7/13/09
REPORT TO QUALITY ASSURANC THE DYSON CORPOR	CE RATION	Jos. Dyson	HIP TO N & SONS INC.	
53 FREEDOM RD.	,	53 FREEDOM	1 RD.	
PAINESVILLE , OF	44077	PAINESVILI	E, OH 44077	
	. ORDEREL	)		
GRADE 4140	srze 3."		LENGTH 22' 7 3/4"	
ASTM A354-07 GRADE	CUSTOMER SPECIFICA BD; Q&T (AIM FOR 35-3	TONS 7 ROCKWELL C)		
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TO MERCURY TEMPERATURES	OR TO ANY OTHER METAL 2 DURING PROCESSING OR W	ALLOY THAT I HILE IN OUR P	S LIQUID AT AME OSSESSION. **	BIENT
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PAGE 3 OF 3		The state and state and the second state of th		RANAL CONTRACT STATE

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	CERTIFIED MATERIAL	TEST REPORT	CODE NC	J11
	CUSTOMER PART NUMBER	HEAT NUMBER	WORK ORDER NUMBER	DATE
CUSTOMER ORDER NUMBER		M32854	228544 101	//13/09
00015		SHIP TO	5	- <i>4</i> 3
REPORT TO			-	
QUALITY ASSURA	NCE NTTON	JOS. DYSON &	SONS INC.	
THE DISON CORP.				
53 FREEDOM RD.		53 FREEDOM F	ш.	
		PAINESVILLE	, OH 44077	
PAINESVILLE ,	OH 44077			
	ORDERE	D		
GRADE	SIZE	÷.	22! 7 3/4"	
4140	3."	ATIONS		
	CUSTOMER SPECIFIC	7 ROCKWELL C)		
ASTM A354-07 GRA	DE BD, Qui, (Internet)		8	
8		TVOTO		
	CHEMICAL ANA	171212		
	D S Si Ni	Cr Mo	Cu Sn	Al
C MI	P 0			9 0 0 2 0
0.43 0.88	0.014 0.033 0.26 0.15	5 0.93 0.17	0.20 0.00	5 0.020
v Ca	Nb			
0.010 0.0006	0.003			
CDATN ST7F	SPECIFICATION ASTM E112	2 FINE GRAD	IN 5-8	
GRAIN BIZE	_			
		AFTER HT	TREAT	
HARDNESS	SPECIFICATION ASIM EIU	111 1201 11-		
SURFACE HARDNES	S (HRC)			
BATCH 1 - 36 (	100 bars)			
BATCH 2 - 32 (	119 bars)			1
BATCH 3 - 35 (	10 bars)			
BATCH $4 - 37$	io baib,			
		ſ	A BEVIEWED	
		ļ	DATE 7/20 09	
			DYSUN	
		l jun		
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PAGE 1	itvithal these data are correct and the	ompliance:with specified	Prequirements	and an article and an
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3000 East Front Street			Ausilial	Totemp Latine Walant the St
Maarco MI/ 48161	A CALLARY STATES	AND THE REPORT OF THE PARTY OF	Quality, Assurance, Representative	相关的意义

Montoe: MI. 48161



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	CERTIFIED MATERIAL	TEST REPORT	CODE NOT	511
CUSTOMER ORDER NUMBER	CUSTOMER PART NUMBER	HEAT NUMBER M32854	work order NUMBER	DATE 7/13/09
66015	· · · · · · · · · · · · · · · · · · ·			
REPORT TO		SHIP TO	)	
QUALITY ASSURANCE THE DYSON CORPO	CE RATION	JOS. DYSON &	SONS INC.	
53 FREEDOM RD.		53 FREEDOM R	D.	
PAINESVILLE , O	4 44077	PAINESVILLE	, OH 44077	
	ORDERE	)		
GRADE	SIZE		22' 7 <u>3/4</u> "	
4140	CUSTOMER SPECIFICA	TIONS		
ASTM A354-07 GRAD	E BD; Q&T (AIM FOR 35-3	7 ROCKWELL C)		
HARDENABILITY	SPECIFICATION ASTM A255	/A304		
THEORETICAL J1 2 3 4 5 58 58 58 58 58 58	6 7 8 9 10 11 12 13 58 58 56 55 53 51	14 15 16 18 20 49 47 46 46	22 24 26 28 3 44 41	30 32 34 39
PHYSICALS	SPECIFICATION ASTM E8/A	370 AFTER HT	TREAT	• 
	2.0	IN		
TENSILE (KSI)	YIELD (KSI) % ELONGA	TION REDUCTI	ON OF AREA	
Tensile	e(KSI) YIELD ELONGAT	ION ROA		
BATCH 1 - 157.8	136.1 16	47 (100	bars)	
BATCH 2 - 155.0	5 133.1 17	53 (119 A. (40 b	Dais)	9 6
BATCH 3 - 158.2	2 137.7 14	40 (40 D 44 (10 b	ars)	
BATCH 4 - 153.0	) 133.0 14.8			
REDUCTION RATIO			Q.A. REVIEWEI	D
RATIO= 4.9 TO	1.0		DATE 772000	
SURFACE INSPECT TO A ** MATERIAL 100 ARC FURNACE BEEN REPAIN	ASTM F788/F788M-02 D% MELTED AND MANUFACTURI AND CONTINUOUS CASTING RED BY WELDING AND THIS	ED IN THE U.S.A METHOD. THE 5 MATERIAL HAS	. BY THE ELEC PRODUCT HAS NOT BEEN EXP	TRIC NOT POSED

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PAGE



	CERTIFIED MATERIAL TEST REPORT CODE NCJI				
CUSTOMER ORDER NUMBER	CUSTOMER PART NUMBER	HEAT NUMBER M32854	WORK ORDER NUMBER	DATE 7/13/09	
REPORT TO		<b>SHIP T</b>	D		
QUALITY ASSURANC THE DYSON CORPOR	E ATION	JOS. DYSON 8	SONS INC.		
53 FREEDOM RD.		53 FREEDOM RD.			
PAINESVILLE , OH	44077	PAINESVILLE	, OH 44077		
34	ORDERED	)			
GRADE 4140	size 3."		LENGTH 22' 7 3/4"		
ASTM A354-07 GRADE	CUSTOMER SPECIFICA BD; Q&T (AIM FOR 35-3	TROCKWELL C)			

TO MERCURY OR TO ANY OTHER METAL ALLOY THAT IS LIQUID AT AMBIENT TEMPERATURES DURING PROCESSING OR WHILE IN OUR POSSESSION. \*\*

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PAGE 3 OF 3

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Monroe: MIC4816

DIVISION OF ENGINEERING SERVICES Office of Structural Materials **Quality Assurance and Source Inspection** 

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493

Contract #: 04-0120F4 Cty: SF/ALA Rte: 80 PM: 13.2/13.9 File #: 76.15

# S

**Resident Engineer:**Pursell, Gary Address: 333 Burma Road City: Oakland, CA 94607

**Report No:** SIR-001622 Date Inspected: 07-Jan-2010

Project Name: Prime Contractor: Contractor:	SAS Superstructure American Bridge/Fluor Enterprises, a JV Dyson Corp. & Subs			O	OSM Arriva SM Departure Loca	l Time: Time: ation: Pa	900 1700 inesvill	e, Ohio	
Quality Control Co	ntact: H	Bob Bobna	r		Quality Contro	l Present:	Yes	No	
Material transfer:		Yes	No	N/A	Sampled Items:	:	Yes	No	N/A
Stock Transfer:		Yes	No	N/A	OK to Cut:		Yes	No	N/A
Rebar Test Witness	5:	Yes	No	N/A	Delayed/Cancel	lled:	Yes	No	N/A
Other:	MT of ancho	or rod bolt	s						
Bridge No:	34-0006				<b>Component:</b>	See below			
Bid Item:	See below				Lot No:	N / A			

# **Summary of Items Observed:**

The Caltrans Quality Assurance (QA) Inspector Scott Croff was present at Dyson Corp in Painesville, Ohio, to observe the fabrication of components that will be used in the San Francisco / Oakland Bay Bridge (SFOBB) project.

The QA Inspector met with Dyson Quality Control Manager (QCM) Bob Bobnar and Stork Herron Testing Labs (SHTL) Non-Destructive Testing (NDT) Technician Matt Novak. The QA Inspector was informed that Wet-Fluorescent Magnetic Particle Testing (Wet Mag) will be conducted on 3" diameter A354 BD rods [bid item 45 (s) and bid item 61 (s-f)], that have been milled / fabricated at Dyson Corp.

The QA Inspector noted that the anchor rods have machined threads for approximately 300mm on each end, and that the remainder has a stock (turned) finish. The QA Inspector witnessed the NDT technician performing Wet Mag on the machined threads of the anchor rods. Upon completion of the inspection, the QA Inspector was informed that no relevant indications were observed. The QA Inspector conducted verification Wet Mag of the anchor rod threads. See the accompanying TL-6028 report for additional information. See the attached photos.

The QA Inspector was asked by Dyson QCM to verify if only the threaded portions of the anchor rods needed to be examined. The QA Inspector reviewed the contract documents and spoke with the Structural Materials Representative (SMR) Kit Guest. It was determined that the full length of the anchor rods should be examined. The QA Inspector relayed that information to Dyson QCM and the Stork Herron NDT technician. The QA Inspector observed that the shafts of the anchor rods have grease, dirt and light rust and need to be cleaned to facilitate the Wet Mag inspection. At the end of the shift, the QA Inspector noted that Dyson personnel are using

( Continued Page 2 of 2 )

wire brushes and solvent to clean the anchor rods. The QA Inspector was informed that the Wet Mag will be continued tomorrow, Jan. 8th, at 4pm.

The QA Inspector also noted that Dyson personnel are machining / fabricating components for: bid item 45 (s), bid item 59 (s-f), bid item 61 (s-f) and bid item 68 (s-f). The QA Inspector was informed that Dyson will have additional material ready for release tomorrow, to be shipped to WireCo. There were no other notable observations made during this shift.





# **Summary of Conversations:**

See above.

# Comments

Inspected By:	Croff,Scott	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell,Bill	QA Reviewer

DIVISION OF ENGINEERING SERVICES Office of Structural Materials Quality Assurance and Source Inspection

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493 Contract #: <u>04-0120F4</u> Cty: <u>SF/ALA</u> Rte: <u>80</u> PM: <u>13.2/13.9</u> File #: <u>76.15</u>

# SOURCE INSPECTION REPORT

Resident Engineer:Pursell, Gary Address: 333 Burma Road City: Oakland, CA 94607

<b>Report No:</b>	SIR-001623
Date Inspecte	ed: 08-Jan-2010

Project Name: SAS Superstructure					OSM Arrival Time: 1300				
	American Di	luge/11u0	Enterp	115CS, a J V	U,		inic.	2100	
Contractor:	Dyson Corp. & Subs				Locat	ion: Pa	inesville	e, Ohio	
Quality Control Co	ntact: B	ob Bobna	r		Quality Contro	l Present:	Yes	No	
Material transfer:		Yes	No	N/A	Sampled Items:		Yes	No	N/A
Stock Transfer:		Yes	No	N/A	OK to Cut:		Yes	No	N/A
<b>Rebar Test Witness</b>	•	Yes	No	N/A	Delayed/Cancel	led:	Yes	No	N/A
Other:	MT of anchor	r rod bolts	5						
Bridge No:	34-0006				<b>Component:</b>	See below			
Bid Item:	See below				Lot No:	B212-004-10			

# **Summary of Items Observed:**

The Caltrans Quality Assurance (QA) Inspector Scott Croff was present at Dyson Corp in Painesville, Ohio, to observe the fabrication of components that will be used in the San Francisco / Oakland Bay Bridge (SFOBB) project.

The QA Inspector was requested to release suspender socket components [bid item 68 (s-f)] to WireCo. The QA Inspector verified that check samples have been tested by TransLab and found satisfactory for use. The QA Inspector reviewed the contractor's Certificates of Compliance (C.O.Cs) and shipping documentation. The QA Inspector also made random observations of the3.5" A563 HDG full and jam nuts as they were palletized for shipping. The QA Inspector noted that the material and documentation appeared to be in general compliance with the contract requirements. The QA Inspector issued a green tag and TL-6011 report with lot number B212-004-10 for the material release. See the accompanying TL-6011 report for additional information.

The QA Inspector met with Stork Herron Testing Labs (SHTL) Non-Destructive Testing (NDT) Technician Matt Novak. The QA Inspector was informed that Wet-Fluorescent Magnetic Particle Testing (Wet Mag) will be conducted on 3" diameter A354 BD rods [bid item 45 (s) and bid item 61 (s-f)], that have been milled / fabricated at Dyson Corp.

The QA Inspector noted that the anchor rods have machined threads for approximately 300mm on each end, and that the remainder has a stock (turned) finish. The QA Inspector noted that the rods have been cleaned and appear to be free of loose rust, dirt and grease at this time. The QA Inspector witnessed the NDT technician performing Wet Mag on the center lengths (un-machined areas) of the anchor rods. The QA Inspector noted that the threaded

( Continued Page 2 of 2 )

areas were examined yesterday, 1-7-2010. Upon completion of the inspection, the QA Inspector was informed that no relevant indications were observed. The QA Inspector conducted verification Wet Mag of the anchor rods. See the accompanying TL-6028 report for additional information.

The QA Inspector also noted that Dyson personnel are machining / fabricating components for: bid item 45 (s), bid item 59 (s-f), bid item 61 (s-f) and bid item 68 (s-f). There were no other notable observations or conversations during this shift.





# **Summary of Conversations:**

See above.

# Comments

Inspected By:	Croff,Scott	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell,Bill	QA Reviewer

DIVISION OF ENGINEERING SERVICES Office of Structural Materials Quality Assurance and Source Inspection

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493 Contract #: <u>04-0120F4</u> Cty: <u>SF/ALA</u> Rte: <u>80</u> PM: <u>13.2/13.9</u> File #: <u>76.15</u>

# SOURCE INSPECTION REPORT

Resident Engineer:Pursell, Gary Address: 333 Burma Road City: Oakland, CA 94607

<b>Report No:</b>	SIR-001709
Date Inspecte	d: 20-Jan-2010

Project Name: Prime Contractor: Contractor:	SAS Superstructure American Bridge/Fluor Enterprises, a JV Dyson Corp. & Subs			OSM Arrival Time: 900 OSM Departure Time: 1700 Location: Painesville, O					
Quality Control Co	ntact: B	ob Bobnar			Quality Control	Present:	Yes	No	
Material transfer:		Yes	No	N/A	Sampled Items:		Yes	No	N/A
Stock Transfer:		Yes	No	N/A	OK to Cut:		Yes	No	N/A
<b>Rebar Test Witness</b>	:	Yes	No	N/A	Delayed/Cancel	led:	Yes	No	N/A
Other:									
Bridge No:	34-0006				Component:	See below			
Bid Item:	See below				Lot No:	N / A			

### Summary of Items Observed:

The Caltrans Quality Assurance (QA) Inspector Scott Croff was present at Dyson Corp in Painesville, Ohio, to observe the fabrication of components that will be used in the San Francisco / Oakland Bay Bridge (SFOBB) project.

The QA Inspector noted that Dyson personnel are machining / fabricating components for: bid item 45 (s), bid item 61 (s-f) and bid item 68 (s-f). The QA Inspector made general observations of the milling, machining and threading of the various components (sockets, rods, bolts, washers). The QA Inspector noted that all observed work appeared to be performed to commonly accepted industry standards and procedures. See the attached photo.

The QA Inspector was informed that an A354 BD rod, heat treat lot code NCJ10, mill heat M32854 (bid item 45, E2 bearing anchor rod) will be cut in to specimens for tensile and check sample testing. The QA Inspector witnessed the selection of the rod from the manufactured quantity of 65. See the attached photo. The QA Inspector was informed that the tensile tests will be conducted at Tensile Testing Metallurgical Labs, Inc. in Cleveland, Ohio. The QA Inspector made a phone call to the lab and asked to be notified prior to testing. The Lab president Tim Adams replied to the QA Inspector that the samples need to be machined to testing size and that the QA Inspector could be notified to witness the testing. The QA Inspector relayed this information to the Structural Materials Representatives (SMRs) Nina Choy and Kit Guest.

( Continued Page 2 of 2 )





# **Summary of Conversations:**

See above.

# Comments

Inspected By:	Croff,Scott	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell,Bill	QA Reviewer

DIVISION OF ENGINEERING SERVICES Office of Structural Materials **Quality Assurance and Source Inspection** 

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493

Contract #: 04-0120F4 Cty: SF/ALA Rte: 80 PM: 13.2/13.9 File #: 76.15

# S(

**Resident Engineer:**Pursell, Gary Address: 333 Burma Road City: Oakland, CA 94607

0	URCE	INSPE	CTION	REPORT	

**Report No:** SIR-001666 Date Inspected: 26-Jan-2010

Project Name: Prime Contractor: Contractor:	SAS Superstructure American Bridge/Fluor Enterprises, a JV Dyson Corp. & Subs			OS	OSM Arrival 7 5M Departure T Locati	<b>Fime:</b> ime: ion: Pa	900 1700 inesville	, Ohio	
Quality Control Co Motorial transform	ntact: Bo	ob Bobnar Vog	No	NI/A	Quality Control	Present:	Yes	No No	NI/A
Stock Transfer:		Yes	No No	N/A N/A	OK to Cut:		r es Yes	No No	N/A
Rebar Test Witness	5:	Yes	No	N/A	Delayed/Cancel	led:	Yes	No	N/A
Other:									
Bridge No:	34-0006				<b>Component:</b>	See below			
Bid Item:	See below				Lot No:	B212-020-10			

# **Summary of Items Observed:**

The Caltrans Quality Assurance (QA) Inspector Scott Croff was present at Dyson Corp in Painesville, Ohio, to observe the fabrication of components that will be used in the San Francisco / Oakland Bay Bridge (SFOBB) project.

The QA Inspector noted that Dyson personnel are machining / fabricating components for: bid item 45 (s), bid item 61 (s-f) and bid item 68 (s-f). The QA Inspector made general observations of the milling, machining and threading of the various components (sockets, rods, bolts, washers). The QA Inspector noted that all observed work appeared to be performed to commonly accepted industry standards and procedures. See the attached photo.

The QA Inspector met with Dyson Quality Control Manager (QCM) Bob Bobnar and was informed that an A354 BD rod, heat treat lot code NCJ12, mill heat M32854 (bid item 45, E2 bearing anchor rod and bid item 61, Shear Key anchor rod) has been cut in to specimens for tensile and check sample testing. The QA Inspector was informed that the tensile tests will be conducted at Tensile Testing Metallurgical Labs, Inc. in Cleveland, Ohio. The QA Inspector asked about the status of the previous samples, heat treat lot code NCJ10, as the testing lab had not informed the QA Inspector that tests were going to be conducted, as requested. The QA Inspector was informed that the other tests have been performed by the lab and the results were acceptable to the ASTM specifications. The QA Inspector was then shown the lab paperwork from the sample testing.

The QA Inspector was requested to release E2 bearing anchor rods [bid item 45 (s)] to Monnig Industries. The QA Inspector reviewed the Certificate of Compliance (C.O.C) and shipping documentation. The QA Inspector also made random observations of the materials as it was presented. The QA Inspector noted that the material and

( Continued Page 2 of 2 )

documentation appeared to be in general compliance with the contract requirements. The QA Inspector issued a green tag with lot number B212-030-10. The QA Inspector was informed that the material will be shipped to Monnig in Glasgow, Missouri, for hot dip galvanizing. See the accompanying TL-6011 report for specific information. See the attached photos.



# Summary of Conversations:

See above.

# Comments

Inspected By:	Croff,Scott	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell,Bill	QA Reviewer

DIVISION OF ENGINEERING SERVICES Office of Structural Materials **Quality Assurance and Source Inspection** 

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493

Contract #: 04-0120F4 Cty: SF/ALA Rte: 80 PM: 13.2/13.9 File #: 76.8

# COMPONENT MATERIAL INSPECTION REPORT

Resident Engineer: Pursell, Gary Address: 333 Burma Road City: Oakland, CA 94607

Contractor: Dyson Corp. & Subs

Location: Painesville, Ohio

Bridge No.: 34-0006 Report No: CMI-000170 Date Inspected: 26-Jan-2010

**OSM Arrival Time: 900** OSM Departure Time: 1700 **Component:**# E2 Bearing Anchor Rods

The following material has been inspected in accordance with Section 6 of the Standard Specifications at the above location. At this point in the fabrication process it appears to comply with contract plans and specifications.

To be shipped to the following vendor or locations: Monnig Industries, 400 Industrial Drive, Glasgow, Missouri

Lot #	Bid Item #	Quantity		Material Description
B212-020-10	45	64	ea	3" A354 BD rods, 22' 7.73" long, mill M32854, heat lot NCJ10

**Identification:** Green tag was attached to the C.O.C. / shipping package.

# **Summary of Items Observed:**

The QA Inspector reviewed the contractor's Certificate of Compliance (C.O.C) and shipping documentation. The QA Inspector also made random observations of the materials as it was presented. The QA Inspector noted that the material and documentation appeared to be in general compliance with the contract requirements. The QA Inspector issued a green tag with lot number B212-020-10. The QA Inspector was informed that the material will be shipped to Monnig Industries, Glasgow, Missouri, for hot dip galvanizing. The QA Inspector also noted that check sample stock material for the heat treat lot of rods will be included with the shipment.

# **Summary of Conversations:**

See above.

# **Comments**

Inspected By:	Croff, Scott	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell, Bill	QA Reviewer



SIR-001667

Date Inspected: 27-Jan-2010

### DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES Office of Structural Materials **Quality Assurance and Source Inspection** 

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493

Contract #: 04-0120F4 Cty: SF/ALA Rte: 80 PM: 13.2/13.9 File #: 76.15

**Report No:** 

# 5

Resident Engineer: Pursell, Gary Address: 333 Burma Road City: Oakland, CA 94607

SOURCE INSPECTION REPORT
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Project Name:SAS SuperstructurePrime Contractor:American Bridge/Fluor Enterprises, a JV		0	OSM Arriva SM Departure	l Time: Time:	900 1700				
Contractor:	Dyson Corp	. & Subs				Loca	ation: Pa	inesvill	e, Ohio
Quality Control Co	ntact: I	Bob Bobn	ar		Quality Contro	ol Present:	Yes	No	
Material transfer:		Yes	No	N/A	Sampled Items:		Yes	No	N/A
Stock Transfer:		Yes	No	N/A	OK to Cut:		Yes	No	N/A
Rebar Test Witness	:	Yes	No	N/A	Delayed/Cancelled: Yes No		N/A		
Other:									
Bridge No:	34-0006				<b>Component:</b>	See below			
Bid Item:	See below				Lot No:	N / A			

# **Summary of Items Observed:**

The Caltrans Quality Assurance (QA) Inspector Scott Croff was present at Dyson Corp in Painesville, Ohio, to observe the fabrication of components that will be used in the San Francisco / Oakland Bay Bridge (SFOBB) project.

The QA Inspector noted that Dyson personnel are machining / fabricating components for: bid item 45 (s), bid item 61 (s-f) and bid item 68 (s-f). The QA Inspector made general observations of the milling, machining and threading of the various components (sockets, rods, bolts, washers). The QA Inspector noted that all observed work appeared to be performed to commonly accepted industry standards and procedures. See the attached photos.

The QA Inspector was informed that an A354 BD rod, heat treat lot code NCJ12, mill heat M32854 (bid item 45, E2 bearing anchor rods and bid item 61, Shear Key anchor rod) were ready for tensile testing. The QA Inspector traveled to Tensile Testing Metallurgical Labs (TTML) in Cleveland, Ohio. The QA Inspector met with technician Cindy at TTML and was shown the tensile test specimen. The QA Inspector was shown the labs tracking system, the specimen was engraved on the ends, the envelope holding the specimen identified the client and the technician had the specifications for the test. The QA Inspector witnessed the specimen testing. See the attached photos. The QA Inspector observed the technician comparing the yield readings, measuring the elongation and reduction of specimen with ASTM A354 BD requirements. The QA Inspector was informed that the tensile specimen was acceptable to the specification. The QA Inspector was informed that the hardness test specimens are not ready for testing at this time. There were no other notable observations or conversations.

( Continued Page 2 of 2 )



# **Summary of Conversations:**

See above.

# Comments

Inspected By:	Croff,Scott	Quality Assurance Inspector
Reviewed By:	Levell,Bill	QA Reviewer

DIVISION OF ENGINEERING SERVICES Office of Structural Materials **Quality Assurance and Source Inspection** 

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493

Contract #: 04-0120F4 Cty: SF/ALA Rte: 80 PM: 13.2/13.9 File #: 76.15

# S

Resident Engineer: Pursell, Gary Address: 333 Burma Road City: Oakland, CA 94607

<b>Report No:</b>	S	IR-001729
Date Inspected	l:	04-Feb-2010

Project Name: Prime Contractor: Contractor:	SAS Superstr American Bri Dyson Corp.	ucture dge/Fluo & Subs	r Enterp	rises, a JV	OSM Arrival Time: 800 OSM Departure Time: 1630 Location: Painesville, O		e, Ohio		
Quality Control Co	ntact: Bo	ob Bobna	r		Quality Control	Present:	Yes	No	
Material transfer:		Yes	No	N/A	Sampled Items:		Yes	No	N/A
Stock Transfer:		Yes	No	N/A	OK to Cut:		Yes	No	N/A
<b>Rebar Test Witness</b>	5:	Yes	No	N/A	<b>Delayed/Cancel</b>	led:	Yes	No	N/A
Other:	Fastener Asse	mblies							
Bridge No:	34-0006				<b>Component:</b>	Cable System	, E2 Bear	ing, She	ear Keys
Bid Item:	45,59,61,68				Lot No:	n/a			

# **Summary of Items Observed:**

The Caltrans Quality Assurance (QA) Inspector Sherri Brannon was present at Dyson Corporation in Painesville, Ohio, to observe the fabrication of components that will be used in the San Francisco / Oakland Bay Bridge (SFOBB) project.

The QA Inspector Brannon randomly observed Dyson personnel machining / fabricating components for fasteners assemblies for the following: bid item 45 - Furnish and Install Spherical Bushing Bearing (Pier E2), bid item 59 -Furnish Structural Steel (Bridge) (Saddle), bid item 61 - Furnish and Install Shear Key (Pier E2), and bid item 68 Furnish Suspender System. QA Inspector Brannon made general observations of the milling, machining and threading of the various components (rods, bolts, nuts, washers). The QA Inspector Brannon noted that all observed work appeared to be performed to commonly accepted industry standards and procedures.

The following digital photograph below illustrates observation of the activities being performed.

( Continued Page 2 of 2 )





# **Summary of Conversations:**

As stated within this report.

### Comments

Inspected By:	Brannon,Sherri	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell,Bill	QA Reviewer

DIVISION OF ENGINEERING SERVICES Office of Structural Materials **Quality Assurance and Source Inspection** 

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493

Contract #: 04-0120F4 Cty: SF/ALA Rte: 80 PM: 13.2/13.9 File #: 76.15

# S

**Resident Engineer:**Pursell, Gary Address: 333 Burma Road City: Oakland, CA 94607

SOURCE INSPECTION REPORT	
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**Report No:** SIR-001746 Date Inspected: 08-Feb-2010

Project Name: Prime Contractor: Contractor:	SAS Superstr American Bri Dyson Corp.	ucture dge/Fluo & Subs	r Enterp	rises, a JV	OS	OSM Arrival SM Departure 7 Loca	Time: 5 Fime: tion: Pa	800 1630 inesville	e, Ohio
Quality Control Co	ntact: Bo	ob Bobna	r		Quality Control	Present:	Yes	No	
Material transfer:		Yes	No	N/A	Sampled Items:		Yes	No	N/A
Stock Transfer:		Yes	No	N/A	OK to Cut:		Yes	No	N/A
<b>Rebar Test Witness</b>	:	Yes	No	N/A	Delayed/Cancel	led:	Yes	No	N/A
Other:	Fastener Asse	mblies							
Bridge No:	34-0006				<b>Component:</b>	Cable System,	E2 Bear	ing, She	ear Keys
Bid Item:	45,59,61,68				Lot No:	B208-015, 016	5, & 017-	-10	-

# **Summary of Items Observed:**

The Caltrans Quality Assurance (QA) Inspector Sherri Brannon was present at Dyson Corporation in Painesville, Ohio, to observe the fabrication of components that will be used in the San Francisco / Oakland Bay Bridge (SFOBB) project.

Mr. Bob Bobnar informed QA Inspector Brannon that the 3.00"-4UNC-2B heavy hex spherical nuts for bid item #45 and #61, are ready for QA Inspection for green tag release for shipping to Art Galvanizing in Cleveland, Ohio to be hot dipped galvanized. QA Inspector Brannon reviewed applicable documents and verified quantities. After review of the documents and material to be shipped QA Inspector Brannon assigned Caltrans lot number B208-015-10. See Caltrans Component Material Inspection Report, TL-6011 dated February 08, 2010 for specific information.

Mr. Bob Bobnar informed QA Inspector Brannon that the 3.00"-4UNC-2A x 21'-10.84" OAL double end rods for bid item #61 are ready for QA Inspection and green tag release for shipping to Monnig Industries in Glasgow, Missouri for hot dip galvanizing. QA Inspector Brannon reviewed applicable documents and verified quantities. After review of the documents and material to be shipped QA Inspector Brannon assigned Caltrans lot number B208-016-10. See Caltrans Component Material Inspection Report, TL-6011 dated February 08, 2010 for specific information. QA Inspector Brannon also noted that check sample stock material for the heat treat lot of rods will be included with the shipment.

Mr. Bob Bobnar informed QA Inspector Brannon that the 3.00"-4UNC-2A x 22'-2.81" OAL double end rods for bid item #45 are ready for QA Inspection and green tag release for shipping to Monnig Industries in Glasgow,

( Continued Page 2 of 2 )

Missouri for hot dip galvanizing . QA Inspector Brannon reviewed applicable documents and verified quantities. After review of the documents and material to be shipped QA Inspector Brannon assigned Caltrans lot number B208-017-10. See Caltrans Component Material Inspection Report, TL-6011 dated February 08, 2010 for specific information.

The QA Inspector Brannon randomly observed Dyson personnel machining / fabricating components for fasteners assemblies for the following: bid item #45 - Furnish and Install Spherical Bushing Bearing (Pier E2), bid item #59 -Furnish Structural Steel (Bridge) (Saddle), bid item #61 - Furnish and Install Shear Key (Pier E2), and bid item #68 - Furnish Suspender System. QA Inspector Brannon made general observations of the milling, machining and threading of the various components (rods, bolts, nuts, washers). The QA Inspector Brannon noted that all observed work appeared to be performed to commonly accepted industry standards and procedures.

The following digital photograph below illustrates observation of the activities being performed.





# **Summary of Conversations:**

As stated within this report.

# Comments

Inspected By:	Brannon,Sherri	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell,Bill	QA Reviewer

DIVISION OF ENGINEERING SERVICES Office of Structural Materials **Quality Assurance and Source Inspection** 

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493

Location:

# COMPONENT MATERIAL INSPECTION REPORT

Resident Engineer: Pursell, Gary Address: 333 Burma Road City: Oakland, CA 94607

Painesville, ohio

Contractor: Dyson Corp. & Subs

Bridge No.: 34-0006 **Component:**# E2 Bearing/Shear Key Anchor Ro The following material has been inspected in accordance with Section 6 of the Standard Specifications at the above location. At this point in the fabrication process it appears to comply with contract plans and specifications.

To be shipped to the following vendor or locations: Monnig Industries, 400 Industrial Drive, Glasgow, Missouri

Lot # B208-016-10	<b>Bid Item #</b> 61	<b>Quantity</b> 30	ea	Material Description ASTM A354 Gr. BD - 3-00"-4UNC-2A x 21'-10.84" OAL
				double end rod w/300mm useable thread each end, Lot Code
				NCJ12, Heat #M32854
B208-017-10	45	32	ea	ASTM A354 Gr. BD - 3-00"-4UNC-2A x 22'-2.81" OAL double
				end rod w/300mm useable thread each end, Lot Code NCJ11,
				Heat #M32854

**Identification:** Green tag attached to Certificate of Compliance / Shipping Package.

# **Summary of Items Observed:**

QA Inspector Brannon reviewed the contractor's Certificate of Compliance (C.O.C) and shipping documentation. QA Inspector Brannon also made random observations of the materials as it was presented. QA Inspector Brannon noted that the material and documentation appeared to be in general compliance with the contract requirements. QA Inspector Brannon issued a green tag with Caltrans QA lot number B208-016-10 for bid item #61 - Furnish and Install Shear Keys (Pier E2) and B208-017-10 for bid item #45 - Furnish and Install Spherical Bushing Bearing (Pier E2) for tracking purposes. QA Inspector Brannon was informed by Mr. Bob Bobnar that the material will be shipped to Monnig Industries for hot dip galvanizing. The QA Inspector also noted that check sample stock material for the heat treat lot of rods will be included with the shipment.

# **Summary of Conversations:**

As stated within this report.

# **Comments**

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy, (510) 385-5910, who represents the Office of Structural Materials for your project.





File #: 76.8

Report No: CMI-000175

Date Inspected: 08-Feb-2010

OSM Arrival Time: 800

OSM Departure Time: 1630

Contract #: 04-0120F4 Cty: SF/ALA Rte: 80 PM: 13.2/13.9

Arnold Schwarzenegger, Governor

# COMPONENT MATERIAL INSPECTION REPORT

( Continued Page 2 of 2 )

Inspected By: Brannon, Sherri Quality Assurance Inspector

**Reviewed By:** Levell, Bill

QA Reviewer

DIVISION OF ENGINEERING SERVICES Office of Structural Materials **Quality Assurance and Source Inspection** 

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493

Contract #: 04-0120F4 Cty: SF/ALA Rte: 80 PM: 13.2/13.9 File #: 76.15

# S

Resident Engineer: Pursell, Gary Address: 333 Burma Road City: Oakland, CA 94607

SOURCE INSPECTION REPORT
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**Report No:** SIR-001787 Date Inspected: 11-Feb-2010

Project Name: Prime Contractor: Contractor:	SAS Superstr American Bri Dyson Corp.	ucture dge/Fluor & Subs	Enterp	rises, a JV	OSM Arrival Time: 800 OSM Departure Time: 1630 Location: Painesville, ohio					
Quality Control Contact:		Bob Bobnar			<b>Quality Control Present:</b>		Yes	No		
Material transfer:		Yes	No	N/A	Sampled Items:		Yes	No	N/A	
Stock Transfer:		Yes	No	N/A	OK to Cut:		Yes	No	N/A	
Rebar Test Witness: Yes		Yes	No	N/A	Delayed/Cancelled:		Yes	No	N/A	
Other:	Fastener Asse	embloes								
Bridge No:	34-0006				<b>Component:</b>	Cable System,	E2 Bear	ing, She	ear Keys	
Bid Item:	<b>Item:</b> 45,59,61,68		Lot No:	n/a		-				

# **Summary of Items Observed:**

The Caltrans Quality Assurance (QA) Inspector Sherri Brannon was present at Dyson Corporation in Painesville, Ohio, to observe the fabrication of components that will be used in the San Francisco / Oakland Bay Bridge (SFOBB) project.

The QA Inspector Brannon randomly observed Dyson personnel machining / fabricating components for fasteners assemblies for the following: bid item #45 - Furnish and Install Spherical Bushing Bearing (Pier E2), bid item #59 -Furnish Structural Steel (Bridge) (Saddle), bid item #61 - Furnish and Install Shear Key (Pier E2), and bid item #68 - Furnish Suspender System. QA Inspector Brannon made general observations of the milling, machining and threading of the various components (rods, bolts, nuts, washers). The QA Inspector Brannon noted that all observed work appeared to be performed to commonly accepted industry standards and procedures.

QA Inspector Brannon generated tracking log for tracking different components at various stages for machining, galvanizing, painting, magnetic particle testing, shipping and sampling of QA check samples.

The following digital photograph below illustrates observation of the activities being performed.

( Continued Page 2 of 2 )





# **Summary of Conversations:**

As stated within this report.

### Comments

Inspected By:	Brannon,Sherri	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell,Bill	QA Reviewer

DIVISION OF ENGINEERING SERVICES Office of Structural Materials **Quality Assurance and Source Inspection** 

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493

Contract #: 04-0120F4 Cty: SF/ALA Rte: 80 PM: 13.2/13.9 File #: 76.15

# 5

Resident Engineer: Pursell, Gary Address: 333 Burma Road City: Oakland, CA 94607

SOURCE INSPECTION REPORT
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<b>Report No:</b>	SIR-001788
Date Inspected	<b>12-Feb-2010</b>

Project Name: Prime Contractor: Contractor:	SAS Superstr American Bri Dyson Corp.	ucture dge/Fluoi & Subs	Enterp	rises, a JV	OS	OSM Arrival ' M Departure T Locat	<b>Fime:</b> Sime: ion: Pa	800 1500 inesville	e, Ohio
Quality Control Co Material transfer: Stock Transfer: Rebar Test Witness	ntact: Bo	ob Bobnar Yes Yes Yes Yes	No No No	N/A N/A N/A	Quality Control Sampled Items: OK to Cut: Delayed/Cancel	Present: led:	Yes Yes Yes Yes	No No No No	N/A N/A N/A
Other:Fastener AssembliesBridge No:34-0006Bid Item:45,59,61,68		Component: Lot No:	Cable System, 2 B208-020-10, I	E2 Bear 3208-02	ing, She 1-10	ear Keys			

# **Summary of Items Observed:**

The Caltrans Quality Assurance (QA) Inspector Sherri Brannon was present at Dyson Corporation in Painesville, Ohio, to observe the fabrication of components that will be used in the San Francisco / Oakland Bay Bridge (SFOBB) project.

Mr. Bob Bobnar informed QA Inspector Brannon that the 3.00"-4UNC-2A x 21'-10.84" OAL double end rods ASTM A354 Gr. BD for bid item #61, are ready for QA Inspection for green tag release for shipping to Monnig Ind. in Glasgow, Missouri to be hot dipped galvanized. QA Inspector Brannon reviewed applicable documents and verified quantities. After review of the documents and material to be shipped QA Inspector Brannon assigned Caltrans lot number B208-020-10. See Caltrans Component Material Inspection Report, TL-6011 dated February 12, 2010 for specific information.

Mr. Bob Bobnar informed QA Inspector Brannon that the 7.00" OD x 3.34" ID 1.25" thick spherical washers ASTM A514 for bid item #45 and #61, are ready for QA Inspection for green tag release for shipping to American Bridge MFG in Coraoplis, Pennsylvania for painting. QA Inspector Brannon reviewed applicable documents and verified quantities. After review of the documents and material to be shipped QA Inspector Brannon assigned Caltrans lot number B208-021-10. See Caltrans Component Material Inspection Report, TL-6011 dated February 12, 2010 for specific information. Note: Mr. Bobnar informed QA inspector Brannon that American Bridge/Flour Enterprises, a JV will send an inspection request to METS for Quality Assurance check samples after painting at American Bridge MFG.

The QA Inspector Brannon randomly observed Dyson personnel machining / fabricating components for fasteners

( Continued Page 2 of 2 )

assemblies for the following: bid item #45 - Furnish and Install Spherical Bushing Bearing (Pier E2), bid item #59 -Furnish Structural Steel (Bridge) (Saddle), bid item #61 - Furnish and Install Shear Key (Pier E2), and bid item #68 - Furnish Suspender System. QA Inspector Brannon made general observations of the milling, machining and threading of the various components (rods, bolts, nuts, washers). The QA Inspector Brannon noted that all observed work appeared to be performed to commonly accepted industry standards and procedures.

QA Inspector Brannon as traveled to Art Galvanizing, to observed hot dip galvanizing on 9.84" to 11.81" rectangle x 3.68" ID x 3.25" thick bearing plate washers. Apone arrival QA Inspector Met with Quality Control (QC) Manager Miss. Adrienne Klein. Miss Klein informed QA Inspector Brannon that Art Galvanizing has not started the hot dip galvanizing for tha Caltrans project yet but will be starting soon.

The following digital photograph below illustrates observation of the activities being performed.





# **Summary of Conversations:**

As stated within this report.

# Comments

Inspected By:	Brannon,Sherri	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell,Bill	QA Reviewer

DIVISION OF ENGINEERING SERVICES Office of Structural Materials **Quality Assurance and Source Inspection** 

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493

Contract #: 04-0120F4 Cty: SF/ALA Rte: 80 PM: 13.2/13.9 File #: 76.8

# COMPONENT MATERIAL INSPECTION REPORT

Resident Engineer: Pursell, Gary Address: 333 Burma Road City: Oakland, CA 94607

Contractor: Dyson Corp. & Subs

Location: Painesville, Ohio

Bridge No.: 34-0006 Report No: CMI-000186 Date Inspected: 12-Feb-2010

OSM Arrival Time: 830 OSM Departure Time: 1500 **Component:**# E2 Shear Key Anchor Rods

The following material has been inspected in accordance with Section 6 of the Standard Specifications at the above location. At this point in the fabrication process it appears to comply with contract plans and specifications.

To be shipped to the following vendor or locations: Monnig Industries, 400 Industrial Drive, Glasgow, Missouri

Lot # B208-020-10	<b>Bid Item #</b> ) 61	<b>Quantity</b> 66	ea	Material Description ASTM A354 Gr. BD - 3-00"-4UNC-2A x 21'-10.84" OAL
				double end rod w/300mm useable thread each end, Lot Code
				NCJ12, Heat #M32854

**Identification:** Green tag attached to Certificate of Compliance / Shipping Package.

# **Summary of Items Observed:**

QA Inspector Brannon reviewed the contractor's Certificate of Compliance (C.O.C) and shipping documentation. QA Inspector Brannon also made random observations of the materials as it was presented. QA Inspector Brannon noted that the material and documentation appeared to be in general compliance with the contract requirements. QA Inspector Brannon issued a green tag with Caltrans QA lot number B208-020-10 for bid item #61 - Furnish and Install Shear Keys (Pier E2) for tracking purposes. QA Inspector Brannon was informed by Mr. Bob Bobnar that the material will be shipped to Monnig Industries for hot dip galvanizing.

# **Summary of Conversations:**

As stated within this report.

### **Comments**

Inspected By:	Brannon, Sherri	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell, Bill	QA Reviewer

SIR-001815

Date Inspected: 24-Feb-2010

### DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES Office of Structural Materials Quality Assurance and Source Inspection

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493 Contract #: <u>04-0120F4</u> Cty: <u>SF/ALA</u> Rte: <u>80</u> PM: <u>13.2/13.9</u> File #: <u>99.15</u>

**Report No:** 

# SOURCE INSPECTION REPORT

Resident Engineer:Pursell, Gary Address: 333 Burma Road City: Oakland, CA 94607

Project Name: SAS Superstructure						OSM Arriva	al Time:	930	
<b>Prime Contractor:</b>	ontractor: American Bridge/Fluor Enterprises, a JV			0	SM Departure	e Time:	1500		
Contractor:	Monnig Industries				Loc	ation: Gl	asgow,	MO	
Quality Control Contact:		Ryan Mon	nnig		Quality Contro	ol Present:	Yes	No	
Material transfer:		Yes	No	N/A	Sampled Items	Sampled Items:		No	N/A
Stock Transfer:		Yes	No	N/A	OK to Cut:		Yes	No	N/A
Rebar Test Witness:		Yes	No	N/A	Delayed/Cancelled: Yes		Yes	No	N/A
<b>Other:</b> E2 Bearing and Shear Key Double Ended T			I Threaded Rods Ho	t Dip Galvanizi	ng				
Bridge No:	34-0006				<b>Component:</b>	3" dia. Doub	le Ended/	Fhreade	d Rods
Bid Item:	61				Lot No:	B231			

# **Summary of Items Observed:**

Caltrans Office of Structural Material (OSM) Quality Assurance (QA) Inspector Joselito Lizardo was present as requested to perform observations on the blasting and galvanizing of the various bolt/rod being performed at Monnig Industries, Inc, Glasgow, MO.

This QA randomly observed blasting of 20 pieces of  $3.0^{\circ}$  4UNC 2A X  $21^{\circ} - 10.84^{\circ}$  long Double Ended Rod with 11.81" of useable thread each end per ASTM A354 Gr. BD. The bundles of rods being blasted have trace code of "NCJ 12". The blasting was performed by Phoenix Industies, Inc a company sub contracted by Monnig Industries. The blasting was also performed by Phoenix Industies, Inc personnel Mr. Gene Eddy. Mr. Eddy was noted using Dupont Starblast (Blasting Abrasive) CP2-156C steel grit. Prior to blasting operations, the rods were noted placed in a rack where the rods could roll freely. The blasting was also performed per bundle (10 rods per bundle) with the trace code hard stamped on one end of the rods. The rods were blasted per Surface Preparation Specification No. 10, Near White Blast Cleaning and were deemed acceptable.

After the blasting operation on each bundle of rods, Monnig Quality Control (QC) Ronnie Wise was present to visually inspect the surface condition of the rods. Monnig QC was noted documenting the blasting process of the rods and also the bundle of rods to be blasted.

Each bundle of rods that has grit blasted was noted immediately brought to the pre flux tank for surface preparation prior to galvanizing. After the pre flux bath, the rods (5 pieces at a time) were then dipped slowly into the galvanizing tank and when they were fully submerged into the molten zinc the rods were shaken slowly to make sure the rods were properly galvanized including the threads. This operation took around 4 to 5 minutes


(Continued Page 2 of 3)

before the rods got lifted from the tank.

As soon as the rods were lifted from one side of the rod, excess molten zinc from the thread of the rods were then removed by hand brushing the threads using shoe polish brush that was dipped in water. After completing one side of the rod, the other side was lifted and the same procedure to remove excess molten zinc into the threads was implemented. The rods were then placed in a rack where Monnig personnel were again noted brushing more on the threads of the rods to remove more of the excess galvanizing. After removing all the excess galvanizing, the rods were then brought to another rack wherein the rods were cooled by ambient air. As soon as the rods were cooled to ambient temperature, Monnig Quality Control (QC) Jared Forbes was noted measuring the thickness of the rod galvanizing. The QC was also noted using a thickness gauge named Positest with serial number 51212. Average galvanize thickness reading during the observation was 5.0 mills. During the inspection process, Monnig personnel were also noted performing trial fitting both ends of the rod with the Hex nut. Trial fitting of the rods with the nuts was noted using only their bare hands.



( Continued Page 3 of 3 )





#### **Summary of Conversations:**

As stated above.

#### Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact SMR Nina Choy, (510-385-5910), who represents the Office of Structural Materials for your project.

Inspected By:	Lizardo, Joselito	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell,Bill	QA Reviewer

#### DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES Office of Structural Materials Quality Assurance and Source Inspection

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493 Contract #: <u>04-0120F4</u> Cty: <u>SF/ALA</u> Rte: <u>80</u> PM: <u>13.2/13.9</u> File #: <u>99.15</u>

## SOURCE INSPECTION REPORT

Resident Engineer:Pursell, Gary Address: 333 Burma Road City: Oakland, CA 94607

<b>Report No:</b>	S

Report No:SIR-001817Date Inspected:25-Feb-2010

Project Name:	SAS Superstructure			OSM Arrival Time: 930					
<b>Prime Contractor:</b>	American I	Bridge/Fluc	or Enterp	rises, a JV	OSM Departure Time: 1400				
Contractor:	Monnig Ind	dustries			Location: Glasgow, M			MO	
Quality Control Co	ntact:	Ryan Mon	nig		Quality Control	Present:	Yes	No	
Material transfer:		Yes	No	N/A	Sampled Items:		Yes	No	N/A
Stock Transfer:		Yes	No	N/A	OK to Cut:		Yes	No	N/A
<b>Rebar Test Witness</b>	s:	Yes	No	N/A	<b>Delayed/Cancel</b>	led:	Yes	No	N/A
Other:	E2 Bearing	and Shear	Key Do	uble Ended/T	Threaded Rods Hot	Dip Galvanizing	g		
Bridge No:	34-0006				<b>Component:</b>	3" dia. Double	Ended/	Threade	d Rods
Bid Item:	61				Lot No:	B231			

#### **Summary of Items Observed:**

Caltrans Office of Structural Material (OSM) Quality Assurance (QA) Inspector Joselito Lizardo was present as requested to perform observations on the blasting and galvanizing of the various bolt/rod being performed at Monnig Industries, Inc, Glasgow, MO.

This QA randomly observed Monnig personnel continue blasting 26 pieces of 3.0" 4UNC 2A X 21' – 10.84" long Double Ended Rod with 11.81" of useable thread each end per ASTM A354 Gr. BD. The bundles of rods being blasted have trace code of "NCJ 12". The blasting was performed by Phoenix Industies, Inc a company sub contracted by Monnig Industries. The blasting was also performed by Phoenix Industies, Inc personnel Mr. Gene Eddy. Mr. Eddy was noted using Dupont Starblast (Blasting Abrasive) CP2-156C steel grit. Prior to blasting operations, the rods were noted placed in a rack where the rods could roll freely. The blasting was also performed per bundle (10 rods per bundle) with the trace code hard stamped on one end of the rods. The rods were blasted per Surface Preparation Specification No. 10, Near White Blast Cleaning and were deemed acceptable.

After the blasting operation on each bundle of rods, Monnig Quality Control (QC) Ronnie Wise was present to visually inspect the surface condition of the rods. Monnig QC was noted documenting the blasting process of the rods and also the bundle of rods to be blasted.

Each bundle of rods that has grit blasted was noted immediately brought to the pre flux tank for surface preparation prior to galvanizing. After the pre flux bath, the rods (5 pieces at a time) were then dipped slowly into the galvanizing tank and when they were fully submerged into the molten zinc the rods were shaken slowly to make sure the rods were properly galvanized including the threads. This operation took around 4 to 5 minutes

(Continued Page 2 of 3)

before the rods got lifted from the tank. The galvanizing tank temperature during the operation was noted 835 degree Fahrenheit.

As soon as the rods were lifted from one side of the rod, excess molten zinc from the thread of the rods were then removed by hand brushing the threads using shoe polish brush that was dipped in water. After completing one side of the rod, the other side was lifted and the same procedure to remove excess molten zinc into the threads was implemented. The rods were then placed in a rack where Monnig personnel were again noted brushing more on the threads of the rods to remove more of the excess galvanizing. After removing all the excess galvanizing, the rods were then brought to another rack wherein the rods were cooled by ambient air. As soon as the rods were cooled to ambient temperature, Monnig Quality Control (QC) Jared Forbes was noted measuring the thickness of the rod galvanizing. The QC was also noted using a thickness gauge named Positest with serial number 51212. Average galvanize thickness reading during the observation was 5.0 mills. During the inspection process, Monnig personnel were also noted performing trial fitting both ends of the rod with the Hex nut. Trial fitting of the rods with the nuts was noted using only their bare hands.



#### **Summary of Conversations:**

As stated above.

#### Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or

(Continued Page 3 of 3)

remedial efforts please contact SMR Nina Choy, (510-385-5910), who represents the Office of Structural Materials for your project.

Inspected By:	Lizardo, Joselito	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell,Bill	QA Reviewer

SIR-001818

Date Inspected: 26-Feb-2010

#### DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES Office of Structural Materials Quality Assurance and Source Inspection

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493 Contract #: <u>04-0120F4</u> Cty: <u>SF/ALA</u> Rte: <u>80</u> PM: <u>13.2/13.9</u> File #: <u>99.15</u>

**Report No:** 

## SOURCE INSPECTION REPORT

Resident Engineer:Pursell, Gary Address: 333 Burma Road City: Oakland, CA 94607

Project Name:	Project Name: SAS Superstructure				OSM Arrival Time: 930				
Prime Contractor:	American	Bridge/Flue	or Enterp	orises, a JV	0	<b>OSM Departure Time:</b> 1400			
Contractor:	Monnig In	ndustries		Location: Glasgow,					
Quality Control Contact: Ryan Monnig		Quality Contro	l Present:	Yes	No				
Material transfer:		Yes	No	N/A	Sampled Items	:	Yes	No	N/A
Stock Transfer:		Yes	No	N/A	OK to Cut:		Yes	No	N/A
Rebar Test Witness	5:	Yes	No	N/A	<b>Delayed/Cance</b>	lled:	Yes	No	N/A
Other:	E2 Bearing	g and Shear	Key Do	uble Ended	Threaded Rods Ho	t Dip Galvanizi	ng		
Bridge No:	34-0006				<b>Component:</b>	3" dia. Doubl	e Ended/	Threade	d Rods
Bid Item:	45,61				Lot No:	B231			

#### **Summary of Items Observed:**

Caltrans Office of Structural Material (OSM) Quality Assurance (QA) Inspector Joselito Lizardo was present as requested to perform observations on the blasting and galvanizing of the various bolt/rod being performed at Monnig Industries, Inc, Glasgow, MO.

This QA randomly observed Monnig personnel continue blasting 20 pieces of  $3.0^{\circ}$  4UNC 2A X  $21^{\circ} - 10.84^{\circ}$  and 20 pieces of  $3.0^{\circ}$  4UNC 2A X  $22^{\circ} - 2.81^{\circ}$  long Double Ended Rod with 11.81° of useable thread each end per ASTM A354 Gr. BD. The bundles of rods being blasted have trace code of "NCJ 12" and "NCJ 11" respectively. The blasting was performed by Phoenix Industies, Inc a company sub contracted by Monnig Industries. The blasting was also performed by Phoenix Industies, Inc personnel Mr. Gene Eddy. Mr. Eddy was noted using Dupont Starblast (Blasting Abrasive) CP2-156C steel grit. Prior to blasting operations, the rods were noted placed in a rack where the rods could roll freely. The blasting was also performed per bundle (10 rods per bundle) with the trace code hard stamped on one end of the rods. The rods were blasted per Surface Preparation Specification No. 10, Near White Blast Cleaning and were deemed acceptable.

After the blasting operation on each bundle of rods, Monnig Quality Control (QC) Ronnie Wise was present to visually inspect the surface condition of the rods. Monnig QC was noted documenting the blasting process of the rods and also the bundle of rods to be blasted.

Each bundle of rods that has grit blasted was noted immediately brought to the pre flux tank for surface preparation prior to galvanizing. After the pre flux bath, the rods (5 pieces at a time) were then dipped slowly into the galvanizing tank and when they were fully submerged into the molten zinc the rods were shaken slowly to



( Continued Page 2 of 3 )

make sure the rods were properly galvanized including the threads. This operation took around 4 to 5 minutes before the rods got lifted from the tank. The galvanizing tank temperature during the operation was noted 835 degree Fahrenheit.

As soon as the rods were lifted from one side of the rod, excess molten zinc from the thread of the rods were then removed by hand brushing the threads using shoe polish brush that was dipped in water. After completing one side of the rod, the other side was lifted and the same procedure to remove excess molten zinc into the threads was implemented. The rods were then placed in a rack where Monnig personnel were again noted brushing more on the threads of the rods to remove more of the excess galvanizing. After removing all the excess galvanizing, the rods were then brought to another rack wherein the rods were cooled by ambient air. As soon as the rods were cooled to ambient temperature, Monnig Quality Control (QC) Jared Forbes was noted measuring the thickness of the rod galvanizing. The QC was also noted using a thickness gauge named Positest with serial number 51212. Average galvanize thickness reading during the observation was 5.0 mills. During the inspection process, Monnig personnel were also noted performing trial fitting both ends of the rod with the Hex nut. Trial fitting of the rods with the nuts was noted using only their bare hands.



**Summary of Conversations:** As stated above.

(Continued Page 3 of 3)

#### Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact SMR Nina Choy, (510-385-5910), who represents the Office of Structural Materials for your project.

Inspected By:	Lizardo, Joselito	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell,Bill	QA Reviewer

SIR-001837

Date Inspected: 01-Mar-2010

#### DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES Office of Structural Materials Quality Assurance and Source Inspection

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493 Contract #: <u>04-0120F4</u> Cty: <u>SF/ALA</u> Rte: <u>80</u> PM: <u>13.2/13.9</u> File #: <u>99.15</u>

**Report No:** 

## SOURCE INSPECTION REPORT

Resident Engineer:Pursell, Gary Address: 333 Burma Road City: Oakland, CA 94607

Project Name	SAS Supe	erstructure				OSM Arriv	al Time•	930	
roject Name.	5715 Supe	istructure				Obiii Alliv	ai Time.	)50	
<b>Prime Contractor:</b>	American	Bridge/Flu	or Enterp	orises, a JV	0	SM Departur	e Time:	1400	
Contractor:	Monnig In	ndustries			Location: Glasgow,			MO	
Quality Control Co	ontact:	Ryan Mon	nnig		Quality Contro	l Present:	Yes	No	
Material transfer:		Yes	No	N/A	Sampled Items	:	Yes	No	N/A
Stock Transfer:		Yes	No	N/A	OK to Cut:		Yes	No	N/A
<b>Rebar Test Witnes</b>	s:	Yes	No	N/A	<b>Delayed/Cance</b>	lled:	Yes	No	N/A
Other:	E2 Bearin	g and Shear	Key Do	uble Endec	I/Threaded Rods Ho	t Dip Galvaniz	ing		
Bridge No:	34-0006				<b>Component:</b>	3" dia. Doub	le Ended/	Threade	d Rods
Bid Item:	45				Lot No:	B231			

#### **Summary of Items Observed:**

Caltrans Office of Structural Material (OSM) Quality Assurance (QA) Inspector Joselito Lizardo was present as requested to perform observations on the blasting and galvanizing of the various bolt/rod being performed at Monnig Industries, Inc, Glasgow, MO.

This QA randomly observed Monnig personnel continue blasting 4 pieces of 3.0" 4UNC 2A X 22' – 2.81" long Double Ended Rod with 11.81" of useable thread each end per ASTM A354 Gr. BD. The bundles of rods being blasted have trace code of "NCJ 11". The blasting was performed by Phoenix Industies, Inc a company sub contracted by Monnig Industries. The blasting was also performed by Phoenix Industies, Inc personnel Mr. Gene Eddy. Mr. Eddy was noted using Dupont Starblast (Blasting Abrasive) CP2-156C steel grit. Prior to blasting operations, the rods were noted placed in a rack where the rods could roll freely. The blasting was also performed on 4 rods with the trace code hard stamped on one end of the rods. The rods were blasted per Surface Preparation Specification No. 10, Near White Blast Cleaning and were deemed acceptable.

After the blasting operation on each bundle of rods, Monnig Quality Control (QC) Ronnie Wise was present to visually inspect the surface condition of the rods. Monnig QC was noted documenting the blasting process of the rods and also the bundle of rods to be blasted.

The four rods that were grit blasted were noted immediately brought to the pre flux tank for surface preparation prior to galvanizing. After the pre flux bath, the rods were then dipped slowly into the galvanizing tank and when they were fully submerged into the molten zinc the rods were shaken slowly to make sure the rods were properly galvanized including the threads. This operation took around 4 to 5 minutes before the rods got lifted from the tank.



(Continued Page 2 of 3)

The galvanizing tank temperature during the operation was noted 843 degree Fahrenheit.

As soon as the rods were lifted from one side of the rod, excess molten zinc from the thread of the rods were then removed by hand brushing the threads using shoe polish brush that was dipped in water. After completing one side of the rod, the other side was lifted and the same procedure to remove excess molten zinc into the threads was implemented. The rods were then placed in a rack where Monnig personnel were again noted brushing more on the threads of the rods to remove more of the excess galvanizing. After removing all the excess galvanizing, the rods were then brought to another rack wherein the rods were cooled by ambient air. As soon as the rods were cooled to ambient temperature, Monnig Quality Control (QC) Jared Forbes was noted measuring the thickness of the rod galvanizing. The QC was also noted using a thickness gauge named Positest with serial number 51212. Average galvanize thickness reading during the observation was 5.0 mills. During the inspection process, Monnig personnel were also noted performing trial fitting both ends of the rod with the Hex nut. Trial fitting of the rods with the nuts was noted using only their bare hands.

Today, Monnig Industries was able to galvanize only four pieces of rods that have the heat code NCJ 11 due to breakdown of the compressor machine. Monnig thought they could get a replacement by noon but no compressor arrived and so Monnig informed this QA that blasting/galvanizing will continue tomorrow if the compressor replacement will arrive.









**Summary of Conversations:** 

( Continued Page 3 of 3 )

#### As stated above.

#### Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact SMR Nina Choy, (510-385-5910), who represents the Office of Structural Materials for your project.

Inspected By:	Lizardo, Joselito	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell,Bill	QA Reviewer

SIR-001852

Date Inspected: 02-Mar-2010

#### DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES Office of Structural Materials Quality Assurance and Source Inspection

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493 Contract #: <u>04-0120F4</u> Cty: <u>SF/ALA</u> Rte: <u>80</u> PM: <u>13.2/13.9</u> File #: <u>99.15</u>

**Report No:** 

## SOURCE INSPECTION REPORT

Resident Engineer:Pursell, Gary Address: 333 Burma Road City: Oakland, CA 94607

Project Name: Prime Contractor:	SAS Supe American	perstructure an Bridge/Fluor Enterprises, a JV			0	OSM Arriva SM Departure	al Time: e Time:	930 1400	MO
Contractor:	Moning I	ndustries				Loc	auon: G	asgow,	MO
Quality Control Co	ontact:	Ryan Mon	nig		Quality Contro	ol Present:	Yes	No	
Material transfer:		Yes	No	N/A	Sampled Items	:	Yes	No	N/A
Stock Transfer:		Yes	No	N/A	OK to Cut:		Yes	No	N/A
<b>Rebar Test Witnes</b>	s:	Yes	No	N/A	Delayed/Cance	elled:	Yes	No	N/A
Other:	E2 Bearin	ng and Shear	· Key Do	uble Ended	Threaded Rods Ho	t Dip Galvanizi	ng		
Bridge No:	34-0006	-	-		<b>Component:</b>	3" dia. Doub	le Ended/	Threade	d Rods
Bid Item:	45				Lot No:	B231			

#### **Summary of Items Observed:**

Caltrans Office of Structural Material (OSM) Quality Assurance (QA) Inspector Joselito Lizardo was present as requested to perform observations on the blasting and galvanizing of the various bolt/rod being performed at Monnig Industries, Inc, Glasgow, MO.

This QA randomly observed blasting of 30 pieces of 3.0" 4UNC 2A X 22' – 7.73" long Double Ended Rod with 11.81" of useable thread each end per ASTM A354 Gr. BD. The bundles of rods being blasted have trace code of "NCJ 10". The blasting was performed by Phoenix Industies, Inc a company sub contracted by Monnig Industries. The blasting was also performed by Phoenix Industies, Inc personnel Mr. Gene Eddy. Mr. Eddy was noted using Dupont Starblast (Blasting Abrasive) CP2-156C steel grit. Prior to blasting operations, the rods were noted placed in a rack where the rods could roll freely. The blasting was also performed per bundle (10 rods per bundle) with the trace code hard stamped on one end of the rods. The rods were blasted per Surface Preparation Specification No. 10, Near White Blast Cleaning and were deemed acceptable.

After the blasting operation on each bundle of rods, Monnig Quality Control (QC) Ronnie Wise was present to visually inspect the surface condition of the rods. Monnig QC was noted documenting the blasting process of the rods and also the bundle of rods to be blasted.

Each bundle of rods that has grit blasted was noted immediately brought to the pre flux tank for surface preparation prior to galvanizing. After the pre flux bath, the rods (5 pieces at a time) were then dipped slowly into the galvanizing tank and when they were fully submerged into the molten zinc the rods were shaken slowly to make sure the rods were properly galvanized including the threads. This operation took around 4 to 5 minutes



( Continued Page 2 of 3 )

before the rods got lifted from the tank. The galvanizing tank temperature during the operation was noted 838 degree Fahrenheit.

As soon as the rods were lifted from one side of the rod, excess molten zinc from the thread of the rods were then removed by hand brushing the threads using shoe polish brush that was dipped in water. After completing one side of the rod, the other side was lifted and the same procedure to remove excess molten zinc into the threads was implemented. The rods were then placed in a rack where Monnig personnel were again noted brushing more on the threads of the rods to remove more of the excess galvanizing. After removing all the excess galvanizing, the rods were then brought to another rack wherein the rods were cooled by ambient air. As soon as the rods were cooled to ambient temperature, Monnig Quality Control (QC) Jared Forbes was noted measuring the thickness of the rod galvanizing. The QC was also noted using a thickness gauge named Positest with serial number 51212. Average galvanize thickness reading during the observation was 5.0 mills. During the inspection process, Monnig personnel were also noted performing trial fitting both ends of the rod with the Hex nut. Trial fitting of the rods with the nuts was noted using only their bare hands.

After completing the galvanizing, the rods have cooled down and the trial fit test with the hex nut ("go/no go") were all done, the threads of the rods were wrapped with cardboard and shrink plastic wrapped for protection against damage. These wrapped/bundled rods were then brought to a truck trailer bed where they are stored temporarily while awaiting test results from Caltrans Laboratory.









(Continued Page 3 of 3)

#### **Summary of Conversations:**

As stated above.

#### Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact SMR Nina Choy, (510-385-5910),, who represents the Office of Structural Materials for your project.

Inspected By:	Lizardo, Joselito	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell,Bill	QA Reviewer

SIR-001853

Date Inspected: 03-Mar-2010

#### DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES Office of Structural Materials Quality Assurance and Source Inspection

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493 Contract #: <u>04-0120F4</u> Cty: <u>SF/ALA</u> Rte: <u>80</u> PM: <u>13.2/13.9</u> File #: <u>99.15</u>

**Report No:** 

## SOURCE INSPECTION REPORT

Resident Engineer:Pursell, Gary Address: 333 Burma Road City: Oakland, CA 94607

Project Name: Prime Contractor:	SAS Supe American	perstructure an Bridge/Fluor Enterprises, a JV			0	OSM Arriva SM Departure	al Time: e Time:	930 1400	MO
Contractor:	Moning I	ndustries				Loc	auon: G	asgow,	MO
Quality Control Co	ontact:	Ryan Mon	nig		Quality Contro	ol Present:	Yes	No	
Material transfer:		Yes	No	N/A	Sampled Items	:	Yes	No	N/A
Stock Transfer:		Yes	No	N/A	OK to Cut:		Yes	No	N/A
<b>Rebar Test Witnes</b>	s:	Yes	No	N/A	Delayed/Cance	elled:	Yes	No	N/A
Other:	E2 Bearin	ng and Shear	· Key Do	uble Ended	Threaded Rods Ho	t Dip Galvanizi	ng		
Bridge No:	34-0006	-	-		<b>Component:</b>	3" dia. Doub	le Ended/	Threade	d Rods
Bid Item:	45				Lot No:	B231			

#### **Summary of Items Observed:**

Caltrans Office of Structural Material (OSM) Quality Assurance (QA) Inspector Joselito Lizardo was present as requested to perform observations on the blasting and galvanizing of the various bolt/rod being performed at Monnig Industries, Inc, Glasgow, MO.

This QA randomly observed blasting of 34 pieces of 3.0" 4UNC 2A X 22' - 7.73" long Double Ended Rod with 11.81" of useable thread each end per ASTM A354 Gr. BD. The bundles of rods being blasted have trace code of "NCJ 10". The blasting was performed by Phoenix Industies, Inc a company sub contracted by Monnig Industries. The blasting was also performed by Phoenix Industies, Inc personnel Mr. Gene Eddy. Mr. Eddy was noted using Dupont Starblast (Blasting Abrasive) CP2-156C steel grit. Prior to blasting operations, the rods were noted placed in a rack where the rods could roll freely. The blasting was also performed per bundle (10 rods per bundle) with the trace code hard stamped on one end of the rods. The rods were blasted per Surface Preparation Specification No. 10, Near White Blast Cleaning and were deemed acceptable.

After the blasting operation on each bundle of rods, Monnig Quality Control (QC) Ronnie Wise was present to visually inspect the surface condition of the rods. Monnig QC was noted documenting the blasting process of the rods and also the bundle of rods to be blasted.

Each bundle of rods that has grit blasted was noted immediately brought to the pre flux tank for surface preparation prior to galvanizing. After the pre flux bath, the rods (5 pieces at a time) were then dipped slowly into the galvanizing tank and when they were fully submerged into the molten zinc the rods were shaken slowly to make sure the rods were properly galvanized including the threads. This operation took around 4 to 5 minutes



( Continued Page 2 of 3 )

before the rods got lifted from the tank. The galvanizing tank temperature during the operation was noted 838 degree Fahrenheit.

As soon as the rods were lifted from one side of the rod, excess molten zinc from the thread of the rods were then removed by hand brushing the threads using shoe polish brush that was dipped in water. After completing one side of the rod, the other side was lifted and the same procedure to remove excess molten zinc into the threads was implemented. The rods were then placed in a rack where Monnig personnel were again noted brushing more on the threads of the rods to remove more of the excess galvanizing. After removing all the excess galvanizing, the rods were then brought to another rack wherein the rods were cooled by ambient air. As soon as the rods were cooled to ambient temperature, Monnig Quality Control (QC) Jared Forbes was noted measuring the thickness of the rod galvanizing. The QC was also noted using a thickness gauge named Positest with serial number 51212. Average galvanize thickness reading during the observation was 5.0 mills. During the inspection process, Monnig personnel were also noted performing trial fitting both ends of the rod with the Hex nut. Trial fitting of the rods with the nuts was noted using only their bare hands.

After completing the galvanizing, the rods have cooled down and the trial fit test with the hex nut ("go/no go") were all done, the threads of the rods were wrapped with cardboard and shrink plastic wrapped for protection against damage. These wrapped/bundled rods were then brought to a truck trailer bed where they are stored temporarily while awaiting test results from Caltrans Laboratory.









(Continued Page 3 of 3)

#### **Summary of Conversations:**

As stated above.

#### Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact SMR Nina Choy, (510-385-5910), who represents the Office of Structural Materials for your project.

Inspected By:	Lizardo, Joselito	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell,Bill	QA Reviewer

SIR-001854

#### **DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES Office of Structural Materials **Quality Assurance and Source Inspection** 

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493

Contract #: 04-0120F4 Cty: SF/ALA Rte: 80 PM: 13.2/13.9 File #: 99.15

**Report No:** 

# SOURCE INSPECTION REPORT

**Resident Engineer:**Pursell, Gary Address: 333 Burma Road Citv:

Address: City:	a Road CA 94607			Date Inspected	<b>d:</b> 05-Ma	r-2010		
Project Name:	SAS Supe	erstructure			OSM Arriv	al Time:	930	
Prime Contractor:	American	erican Bridge/Fluor Enterprises, a JV			OSM Departure Time: 1400			
Contractor:	tractor: Monnig Industries, Inc			Loc	cation: G	lasgow,	MO	
Quality Control Co	ntact:	Ryan Mon	nig		Quality Control Present:	Yes	No	
Material transfer:		Yes	No	N/A	Sampled Items:	Yes	No	N/A

Stock Transfer:		Yes No N/A OK to Cut:			Yes	No	N/A		
<b>Rebar Test Witness</b>	•	Yes	No	N/A	<b>Delayed/Cance</b>	elled:	Yes	No	N/A
Other:	E2 Bearing	and Shear	Key All	Threaded	Rods Hot Dip Galva	anizing			
Bridge No:	34-0006				<b>Component:</b>	3" and 2" Di	a. Threade	ed Rods	
Bid Item:	45, 61				Lot No:	B231			

#### **Summary of Items Observed:**

Caltrans Office of Structural Material (OSM) Quality Assurance (QA) Inspector Joselito Lizardo was present as requested to perform material release on the galvanized 2.0" diameter all threaded rods performed at Monnig Industries in Glasgow, MO. In addition this QA Inspector was also requested to release 2.0" diameter heavy hex nuts that were manufactured by Dyson Corp. and previously green tagged with Caltrans Lot number B206-114-09.

This QA was also requested to perform sampling of 3.0" 4UNC 2A X 22' – 7.73" long Double Ended Rod with 11. 81" of useable thread each end per ASTM A354 Gr. BD rods that were blasted and galvanized by their company. The 3" diameter with various lengths, threaded both ends rods per ASTM A354 Gr. BD were blasted per Surface Preparation Specification No. 10, Near White Blast Cleaning and galvanized per ASTM A-153. QA has previously monitored the blasting and galvanizing on these mentioned threaded rods and deemed acceptable to the project specification.

This 2" diameter all threaded rods mentioned above are being released by virtue of satisfactory test results from Caltrans Structural Materials Testing Laboratory dated February 1, 2010 (NSH) and February 18, 2010 (NSH2). QA Joselito Lizardo reviewed the Monnig Industries and Dyson Corporation's Certified Material Test Report/Certificate of Compliance and deemed acceptable.

QA Joselito Lizardo also made random observations of the materials as they were presented. QA Inspector Lizardo noted that the material and documentation appeared to be in general compliance with the contract requirements. QA Inspector Lizardo issued an orange tag with Caltrans QA lot number B231-012-10 for the 2.0" diameter all threaded rod with heat code NSH, B231-013-10 for the 2.0" diameter all threaded rod with heat code

(Continued Page 2 of 2)

NSH2 and B231-014-10 for the 2" diameter Heavy Hex Nuts.

QA Inspector Lizardo was informed by Mr. Ryan Monnig that the material will be shipped to American Bridge/Fluor AJV, 375 Burmah Road, Oakland, CA.

As for the material sampling, Monnig personnel prepared all the necessary supporting documents that were included in the shipment of the rod/test samples. QA reviewed the documentation and the two sets of samples (1-3" diameter X 47 ¼" long, threaded one end and galvanized and 2-3" diameter X 12" long blank material per set) to be shipped. After finding the documents and samples were in order, QA made a Caltrans Sample Identification Cards (TL-0101) with assigned Caltrans Lot number B231-015-10 and B231-016-10 and were attached to the documentation.

#### **Summary of Conversations:**

As stated above.

#### Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact SMR Nina Choy, (510-385-5910), who represents the Office of Structural Materials for your project.

Inspected By:	Lizardo, Joselito	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell,Bill	QA Reviewer

#### DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES Office of Structural Materials Quality Assurance and Source Inspection

Bay Area Branch 690 Walnut Ave.St. 150 Vallejo, CA 94592-1133 (707) 649-5453 (707) 649-5493 Contract #: <u>04-0120F4</u> Cty: <u>SF/ALA</u> Rte: <u>80</u> PM: <u>13.2/13.9</u> File #: <u>76.9</u>

# **REPORT OF INSPECTION OF MATERIAL**

Resident Engineer:Pursell, Gary Address: 333 Burma Road

**City:** Oakland, CA 94607

Project Name: SAS Superstructure

Prime Contractor: American Bridge/Fluor Enterprises, a JV

Contractor: Dyson Corp. & Subs

Report No: RIM-000019 Date Inspected: 16-Mar-2010

OSM Arrival Time: 1130 OSM Departure Time: 1330

Location: Monnig Industries-Glasgow, I

The following material has been inspected in accordance with Section 6 of the Standard Specifications and found to substantially comply\* with contract plans and specifications.

10.84"
2.81"
7.73"
10.84"
eavy Hex

Identification: Orange Tag (1 ea) attached to COC Package

Shipped to: Job Site

## Summary of Items Observed:

This report was taken from QA inspector Gary Richmond's Microsoft Word Document TL-29 for the project with QA inspector Michael Foerder performing the input of information to the PMIV.

The (QAI) Inspector reviewed the following documents provided by Monnig Industries for the items mentioned above. The MTR's, the tensile test reports, the magnetic particle testing reports, the galvanizing certificates and the blast reports, all items were in compliance with applicable specifications.

## Summary of Conversations:

No significant conversations for this date.

## Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact, who represents the Office of Structural Materials for your project.

# **REPORT OF INSPECTION OF MATERIAL**

( Continued Page 2 of 2 )

**Reviewed By:** Levell, Bill

QA Reviewer

#### CERTIFIED MATERIAL TEST REPORT

	IP.	53	53 Freedom Road				440-946-3500		
	NUT	Paine	Painesville, OH, 44077				440-352-2700 fax		
DYSON	CUST	OMER	1	· ITEM	QUA	NTITY	DATE		
ORDER#	ORD	DER#		NUMBER	SH	PPED	SHIPPED		
L 102215 6	660110-SA	-017 CO1	.3 1	of 12	G	pcs	1/26/10		
CUSTOMER American Bridge / Fluor JV 375 Burma Road Oakland, CA 94607 USA DRAWING E2Bearing&ShearKey AnchorRod				PRODUCT DESC 3.00"-4UNC-24 w/300mm use ASTM-A153 w galvanize. (Bid SPECIFICATION ASTM A354-02 10-1.59, 10-1.60 Caltrans hold	CRIPTION A x 22'-7.73" C able thread ea y/near white I Item 45- E2 VS 7a Grade BD 0, 10-1.61 std a points apply	OAL doub ich end. H metal blas Bearing A with spec specificat to this or	le end rod IDG per st prior to anchor Rod ial provisions ions 75-1.05 der		
STARTING MATERIAL	<i>DIA</i>	GRADE	07Y	LOT CODE	HEAT NO.	c	DRIGINAL MILL		
Round Bar	3.000	BD	64	NCJ10	M32854	C	Gerdau Macsteel		

The product listed above was manufactured, tested, sampled, and inspected in accordance with the specification, purchase order, and any supplementary requirements and was found to meet those requirements unless otherwise noted. 64 pcs. sent to HDG on 1/26/10

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION INSPECTION RELEASE TAG 7L-0624 (REV. 10/03)	STATE OF CALIFORNIA STOCK MATERIAL
STATE LOT NO. 8288 003 - 10	LOT NO. \$212-020-10
CONTRACT NO. 04-0120 F4	NSPECTOR'S F4
RELEASED (*) By 2 R DATE 3/16/10 EM 92 1554	NAME S. CAFF DATE 1.26.10

<u>Attachments;</u> Mill Test Report Mechanical Test Reports N.D.E. Report Galvanizing Certification

Deborah A. Smith Q.A. Admin. Assistant

LARGE DIAMETER FASTENERS & FORGINGS / STANDARDS & SPECIALS / COMMERCIAL, MILITARY & NUCLEAR SPECIFICATIONS



	CERTIFIED MATERIAL	TEST REPORT	CODE NC	J10
CUSTOMER ORDER NUMBER	CUSTOMER PART NUMBER	HEAT NUMBER M32854	work order NUMBER 228544 101	DATE 7/13/09
REPORT TO QUALITY ASSURAN THE DYSON CORPO	CE RATION	SHIP TO JOS. DYSON &	SONS INC.	
53 FREEDOM RD.		53 FREEDOM RI	D.	
PAINESVILLE , OF	H 44077	PAINESVILLE	, OH 44077	
	ORDEREI	D		
GRADE 4140	size 3."		<i>LENGTH</i> 22'73/4"	
ACTIM AREA OT CRADE	CUSTOMER SPECIAC	ATTONS		
ASIM ASS4-07 GRADI	BD, QAI, (AIM TOK 55 5		· · ·	1
	CHEMICAL ANA	LYSIS	×	
C Mn	P S Si Ni	Cr Mo	Cu Sn	Al
0.43 0.88 0.	014 0.033 0.26 0.15	0.93 0.17	0.20 0.009	0.020
V Ca	Nb		۰. ×	
0.010 0.0006 0.	003			
GRAIN SIZE	SPECIFICATION ASTM E112	FINE GRAIN	5-8	
HARDNESS	SPECIFICATION ASTM E10	AFTER HT T	REAT	
SURFACE HARDNESS	(HRC)		· , •	
BATCH 1 - 36 (10	0 bars) 9 bars)		112	
BATCH 2 - 32 (11) BATCH 3 - 35 (40) BATCH 4 - 37 (10)	bars) bars)	,		N
		[0A	PEVIEWED	
			Thola	
			DYSONICI	
PAGE 1	al heseleal gratex correctivant in a con	ollance; with specified ned	UNEHERISEX	
Gerdau MacSteel Montoe			1. 10/00	
Montoe MI (4816)			Assorante Reples enduced as	EN LADIALIS

CONTINUED ON PAGE 2



hris Easler

Ouality/Assurance Representative

	CERTIFIED MATERIAL	TEST REPORT	CODE NCJ10
CUSTOMER ORDER NUMBER	CUSTOMER PART NUMBER	HEAT NUMBER M32854	work order number DATE 228544 101 7/13/09
QUALITY ASSURANCE THE DYSON CORPOR	EATION	SHIP TO JOS. DYSON &	SONS INC.
53 FREEDOM RD.		53 FREEDOM R	D.
PAINESVILLE , OH	44077	PAINESVILLE	, OH 44077
GRADE	SIZE	, 	LENGTH
4140	3."	TIONS	22' 7 3/4"
ASTM A354-07 GRADE	BD; Q&T (AIM FOR 35-3	7 ROCKWELL C)	
HARDENABILITY	SPECIFICATION ASTM A255	/A304	
THEORETICAL J1 2 3 4 5 58 58 58 58 58 58 5	6 7 8 9 10 11 12 13 3 8 58 56 55 53 51 4	14 15 16 18 20 2 49 47 46 46	22 24 26 28 30 32 34 44 41 39
PHYSICALS	SPECIFICATION ASTM E8/A	370 AFTER HT	TREAT
	2.0	IN	
TENSILE (KSI)	YIELD (KSI) % ELONGA	TION REDUCTION	ON OF AREA
Tensile BATCH 1 - 157.8 BATCH 2 - 155.6 BATCH 3 - 158.2 BATCH 4 - 153.0	(KSI) YIELD ELONGAT: 136.1 16 133.1 17 137.7 14 133.0 14.8	ION R0A 47 (100 h 53 (119 h 40 (40 ba 44 (10 ba	pars) pars) ars) ars)
REDUCTION RATIO	1.0		Q.A. REVIEWED
SURFACE INSPECT TO AS ** MATERIAL 100 ARC FURNACE BEEN REPAIR	STM F788/F788M-02 % MELTED AND MANUFACTURE AND CONTINUOUS CASTING ED BY WELDING AND THIS	ED IN THE U.S.A. METHOD. THE F MATERIAL HAS	DATE TO DYSON OF DYSON OF BY THE ELECTRIC PRODUCT HAS NOT NOT BEEN EXPOSED
PAGE 2		in ance with specified ro	edultements

Gerdau MacSteel Monioe 3000 East Front Street

Monroe, MI 48161



1112年2月1月

Chins Easler (1)

Sector Quality Assurance, Representative Herein

	CERTIFIED MATERIAL	TEST REPO	DRT	CODE NCJ	510
CUSTOMER ORDER NUMBER 66015	CUSTOMER PART NUMBER	неат МЗ 2	<i>пимвек</i> 854	WORK ORDER NUMBER	DATE 7/13/09
	F		SHIP TO	le.	
THE DYSON CORPOR	ATION	JOS.	DYSON &	SONS INC.	
53 FREEDOM RD.		53 FR	EEDOM RI	D.	
PAINESVILLE , OH	44077	PAINE	SVILLE	, OH 44077	
5	ORDERED	)			
GRADE	SIZE		-	LENGTH 22 י 7 א בי י 2	
4140	CUSTOMER SPECIFICA	TIONS			
ASTM A354-07 GRADE	BD; Q&T (AIM FOR 35-3"	7 ROCKWE	LL C)		
TEMPERATURES	DURING PROCESSING OR W	HILE IN (	DUR POSS	Q.A. REVIEWED DATE 72007	
			a.		

#### PAGE

Gerdau MacSteel Monfoe 3000 East Front/Streel Monroe, MI 48.161



A DIVISION OF J.T. ADAMS CO., INC.

4520 WILLOW PARKWAY CLEVELAND, OHIO 44125 PHONE (216) 641-3290 FAX (216) 641-1223 www.tensile.com

Dyson Corporation 53 Freedom Road Painesville OH 44	4077			Job No.: Date: Cust. PO#;	B0-020-935 1-22-10 70231
Description:	6 samples SO# 102215	(1) 3" Dia. Code# NC.	x 6" Lg, & (5) 3" J-10 Heat# M328.	Dia. x 1/2" Lg. 54	
Spec:	ASTM A354 Caltran Speci Specifications	07a Grade B al Provisions 75-1.05 Ap	BD s 10-1.59, 10-1.60 & plies	: 10-1.61; Plus Caltra	ans Standard
		····- Т]	EST RESULTS	••••••	
Tens	ile, ksi Yield	1, .2% ksi	Elong., % in 4D	Red of Area %	Hardnoss UDC

CERTIFIED TEST REPORT

Req. (Min.):	140	115 115	Elong., % in 4D 14	<u>Red. of Area, %</u> 40	Hardness, HRC 31-39
	154	132	16	55	34
			a a the s		34
					35
					34
					35
			er enzer ihr herrenderstatte under hälterbergenstatte un en		

Test Method: ASTM A370-09a

The above conforms to specifications listed.

This material tested in accordance with the Tensile Testing's Quality System Manual dated 2/15/07 Rev. D as audited and approved by Dyson. The reported results represent the actual attributes of the material tested and indicate full compliance with all applicable specification and contract requirements. We certify that the foregoing is a true copy of the data resulting from tests performed in the laboratory.

Authorized Signature

Timothy J. Adams, President



Page 1 of 1

## This Report May Not Be Reproduced Except in Full

This report represents Tensile Testing interpretation of the results obtained from the test and is not to be construed as a Guaranty or Warranty of the condition of the materials tested. Tensile Testing shall not be held liable for misinterpretation of conditions, loss, damage, injury or death arising from or attributable to delay preceding a test or subsequent to performance of a test.

STORIA Materials Technology

#### 1/12/2010

۰.

Steve Marsh Dyson Corp. 53 Freedom Road 53 Freedom Rd PAINESVILLE, OH 44077-1232

Date Received: 1/7/2010

Test Report No.: DYS006-10-01-94359-1

#### **Stork Herron Testing Laboratories**

Material Testing and Non-Destructive Testing

5405 E. Schaaf Road Cleveland, OH 44131 USA

**TEST REPORT** 

Telephone : (216) 524-1450 Fax : (216) 524-1459 Website : www.storkherron.com

P.O. No.: 70023

Sample Description: One (1) Lot (5 Pcs) 3" - 4 UNC X 22' 7 3/4" Long Double End Threaded Rods, Per ASTM A490-08a, ASTM F788, Caltran Special Provisions 10-1.59, 10-1.60 and 10-1.61, 75-1.05 apply to this work, On-Site Testing 1-7-10, Job#: L 102215

#### MAGNETIC PARTICLE INSPECTION REPORT

Standard:	ASTM F788	-06	t. 10-		
Procedure:	SOP 42.03				
METHOD		e - e - 100		Carrowall	de la companya de la
Dry			🛛 We	et	
PARTICLES					
Magnaflux Particl BA Red SA Black SA Black SA Black SA Black CURRENT	l <b>es:</b> 14A 14AM Other (	Part Preparation None Require Solvent Clea Grinding Other	n: ed n		Wet Particle Carrier:         Magnaflux Carrier II         Pre Mixed         Concentration         MI         Batch No.
AC			☐ FV	VDC	
Central Condu	ctor (AMPS)		🗌 He	ad Shot	(AMPS)
Coil (AMPS)			Pr	ods (AN	1PS/Spacing)
Field Verified by: Pie Gage QQI Hall Effect Probe					
EQUIPMENT					
Magnaflux H-720 S/N: 81471 Cal Due Date:					
Yoke X AC	DC S/N: 9	9438 Spacing: 4"	-8" C	al Due [	Date: 2/11/10

The above services were performed in accordance with Herron Testing Laboratories' Quality Assurance Program Edition 1, Revision 3 dated 6/30/09. Information and statements in this report are derived from material, information and/or specifications furnished by the client and exclude any expressed or implied warranties as to the fitness of the material tested or analyzed for any particular purpose or use. This report is the confidential property of our client and may not be used for advertising purposes. This report shall not be reproduced except in full, without written approval of this laboratory. The recording of false, fictilitous or fraudulent statements or entries on this document may be punished as a felony under Federal Statutes.

Faula Iesar

Sample remnants are held for a minimum of 6 months following issuance of test results, at which point they will be discarded unless notified in writing by the client. This material was not contaminated by mercury or chlorinated solvents during the handling and processing at Stork-Herron Testing Laboratories facilities. Paula Tesar Quality Administrator

## Stork Herron Testing Laboratories

STORIA Materials Technology

1/12/2010

Steve Marsh Dyson Corp. 53 Freedom Road 53 Freedom Rd PAINESVILLE, OH 44077-1232

Date Received: 1/7/2010

Test Report No.: DYS006-10-01-94359-1

Material Testing and Non-Destructive Testing

5405 E. Schaaf Road Cleveland, OH 44131 USA

Telephone : (216) 524-1450 Fax : (216) 524-1459 Website : www.storkherron.com

## TEST REPORT

P.O. No.: 70023

INSPECTION RESULTS						
Quantity	Results					
5 PCS NCJ10 3"-4UNC-2AX22'- 7.73"	ACCEPTABLE					
Comments:	I					
Marking Requirements:						
Demag and post cleaning requirements:						
Inspected by:		Certification: ASNT-SNT-TC-1A				
Matthew Novak						

The reported results represent the actual attributes of the material tested and indicate full compliance with all applicable specification and contract requirements.

#### EXPORT CONTROLLED (ITAR)

THE TECHNICAL DATA AND / OR MATERIALS ASSOCIATED WITH THIS ORDER FALLS WITHIN THE DEFINITION OF THE INTERNATIONAL TRAFFIC IN ARMS REGULATIONS (ITAR) AND IS SUBJECT TO THE EXPORT CONTROL LAWS OF THE U.S. GOVERNMENT. TRANSFER OF THIS DATA BY ANY MEANS TO A FOREIGN PERSON OR FOREIGN ENTITY, WHETHER IN THE UNITED STATES OR ABROAD, WITHOUT AN EXPORT LICENSE, ITAR EXEMPTION OR OTHER APPROVAL FROM THE U.S. DEPARTMENT OF STATE, IS PROHIBITED.

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Faula Isar

Sample remnants are held for a minimum of 6 months following issuance of test results, at which point they will be discarded unless notified in writing by the client. This material was not contaminated by mercury or chlorinated solvents during the handling and processing at Stork-Herron Testing Laboratories facilities.

Paula Tesar Quality Administrator



Phoenix Manufacturing, Inc. P.O. BOX 330 26666 Von Holten Rd. Cole Camp, MO. 65325 660-668-2611 660-668-3160 (fax)

SSPC-SP10 Near White Metal Blast

Near-White Blast Cleaning - Removal of nearly all mill scale, rust, rust scale, paint, or foreign matter by the use of abrasives propelled through nozzles or by centrifugal wheels, to the degree hereafter specified. A Near-White Blast Cleaned Surface Finish is defined as one from which all oil, grease, dirt, mill scale, rust, corrosion products, oxides, paint or other foreign matter have been completely removed from the surface except for very light shadows, very slight streaks or slight discolorations caused by rust stain, mill scale oxides, or light, tight residues of paint or coating that may remain. At least 95 percent of each square inch of surface area shall be free of all visible residues, and the remainder shall be limited to the light discoloration mentioned above

DYSON	CORP	PURCHASE	ORDER	69	398								
				3	EA NSH	2 "	4 1/2	UN	С	2A x	11	05MM	I
				RE.	PLACEM	ENT	PARTS						к.
		PURCHASE	ORDER	70	634								
				66	EA	3"	-4UNC	2A	х	21'	- 1	0.84	n
		PURCHASE	ORDER	70.	345								
				64	EA	3"	-4unc	2 A	x	22'	-	7.73	п
				64	EA	3"	-4UNC	2A	x	47.	25"		
		PURCHASE	ORDER	705	549								
				32	EA	3"	-4UNC	2A	x	22'	-2	.81"	
				30	EA	3"	-4UNC	2A	x	21'	-10	<b>J.</b> 84'	0
				1 E	A	3"	-4UNC	2 A	x	47.2	25"		

•

# **Monnig Industries, Inc.**

HOT DIP & MECHANICAL GALVANIZING P.O. BOX 98 GLASGOW, MO 65254 PH. 660-338-2242 FAX: 660-338-5199

#### MARCH 5, 2010

DYSON CORPORATION 50 FREEDOM ROAD PAINESVILLE, OH 44077

. . . .

RE: GALVANIZING CERTIFICATE P.O. 70345 CALTRAN RODS 64 PCS 3.00" -4UNC 2A X 22'- 7.73" LG DBL END ROD W/ 11.81" OF USEABLE THREAD EA. END 1 PC 3.00"-4UNC 2A X 47.25" SINGLE END ROD W/ 11.81" OF USEABLE THREAD ONE END

THIS WILL CERTIFY THAT THE MATERIAL GALVANIZED ON THE ABOVE JOB MEETS OR EXCEEDS THE MINIMUM REQUIREMENTS OF ASTM A-153 SPECIFICATIONS.

MILL READINGS

4.2	5.2	4.5	6.0	
5.0	6.0	7.0	5.5	
5.9	5.0	5.2	4.2	

PATRICIA S. WESTHUES NOTARY PUBLIC STATE OF MISSOURI HOWARD COUNTY MY COMMISSION EXP. APR. 18, 2012

HN MONNIG, PRESIDENT

PATRICIA S. WESTHUES, NOTARY PUBLIC

#### CERTIFIED MATERIAL TEST REPORT

<u> </u>	RP.	53 Fr	eedom Road			440-946-3500		
	NUT	Painesv	/ille, OH 44077			440-352-2700 fax		
DYSON ORDER# L 102217	cu o 660110-5	stomer rder# SA-017 CO13	N 3	ITEM UMBER of 12	аџа shii ЗО	NTITY PPED <b>pcs</b>	DATE SHIPPED	
CUSTOMER American Bridge / Fluor JV 375 Burma Road Oakland, CA 94607 USA DRAWING				PRODUCT DESCRIPTION 3.00"-4UNC-2A x 21'-10.84" OAL double end w/300mm useable thread each end. HDG pe ASTM-A153 w/near white metal blast prio galvanize. (Bid Item 61- E2 Shear Key And SPECIFICATIONS ASTM A354-07a Grade BD with special pro 10-1.59, 10-1.60, 10-1.61 std specifications 7				
STARTING MATER	IAL DIA	GRADE	отч	LOT CODE	HEAT NO.	(	ORIGINAL MILL	
Round Bar	3.000	BD	30	NCJ12	M32854		Serdau Macsteel	

The product listed above was manufactured, tested, sampled, and inspected in accordance with the specification, purchase order, and any supplementary requirements and was found to meet those requirements unless otherwise noted.

PLUS 2 pls. 12" LA. TEST DROPS PLMS Ipc. 47.25" LA. DA SAMPLE THALABLA ONE END ONLY. **STATE OF CALIFORNIA STOCK MATERIAL** From: Dyson TO: Monnig Ind. MD LOT NO. 73208-016-10 INSPECTOR'S Attachments: Mill Test Report 31.10.15 614 DATE 2-8-10 Mechanical Test Report N.D.E. Report STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION Deborah A. Smith Galvanizing Certification INSPECTION RELEASE TAG A. Admin. Assistant TL-0624 (REV. 10/03) CLEAR SPECIFICATIONS LARGE DIAMETER FASTENERS & FORG STATE LOT NO. CONTRACT NO.

RELEASED (\*) B

GERDAU MAESTEEL C

1. . .

5591 MORRILL ROAD JACKSON, MICHIGAN 49201 .

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		THET DEPORT	CODE NO	J12
	CERTIFIED MATERIAL	HEAT NUMBER	WORK ORDER NUMBER	DATE
CUSTOMER ORDER NUMBER	CUSTOMER PART NUMBER	M32854	228544 101	1/13/05
6015				
		SHIP TO	•	
OUALITY ASSURAN	NCE	JOS. DYSON &	SONS INC.	
THE DYSON CORPO	ORATION		חי	
TO TREEDOM RD		53 FREEDOM R	ω.	
53 FREEDOM RD.		PAINESVILLE	, OH 44077	
PAINESVILLE , C	OH 44077			
	ORDER	ED	LENGTH	
GRADE	SIZE		22' 7 3/4"	
4140	CUSTOMER SPECIF	RCATIONS	а на та 10 ст. ж.	
	DE BD; Q&T (AIM FOR 35-	37 ROCKWELL C)		
ASTM A354-07 GRA				
1	CHEMICAL AN	NALYSIS		
		N Cr MO	Cu S	n Al
c Mn	P S Si <sup>r</sup>	NI CI III		09 0.020
	0.014 0.033 0.26 0.1	15 0.93 0.17	0.20 0.0	
0.43 0.88	0.014 0.000		8 Su	
v Ca	Nb			
0.000	0.003			
0.010 0.0008	0.000			
	AND ASTM E1	12 FINE GRA	IN 5-8	
GRAIN SIZE	SPECIFICATION TO PAR	ž		
		0 AFTER HT	TREAT	đ.
HARDNESS	SPECIFICATION ASIM EI	U C		1.20
AUDENCE HARDNE	SS (HRC)			
BATCH 1 - 36	(100 bars)			5
BATCH 2 - 32	(119  bars)		ĸ	
BATCH $3 - 35$	(10 bars)		÷	
BATCH 4 - 57		1	DA DEVIEWED	
а 1			Q.A.	
			DATE 7/20 09	
			DYSON	
			) from the state of the state o	
		Program and a large harder		WE REAL PLANT
PAGE 1	A STATE OF THE STATE OF	heompliancewithspeci		
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GerdauMacSteelMonro	oenst state to be a state of the		ALA DUBILITY ASSOCIATE REDIES EL	HUNDER STORE STORE
3000/East front/Streets				yut.
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	CERTIFIED MATERIAL	TEST REPORT	CODE NO	512
CUSTOMER ORDER NUMBER	CUSTOMER PART NUMBER	HEAT NUMBER M32854	WORK ORDER NUMBER	DATE 7/13/09
QUALITY ASSURANCE THE DYSON CORPORA	ATION	JOS. DYSON &	SONS INC.	
53 FREEDOM RD.		53 FREEDOM R	D.	
PAINESVILLE , OH	44077	PAINESVILLE	, OH 44077	
	ORDEREI	)		
GRADE	SIZE		LENGTH 22' 7 3/4"	
4140	CUSTOMER SPECIFICA	TONS	en e	
ASTM A354-07 GRADE	BD; Q&T (AIM FOR 35-3	7 ROCKWELL C)		
HARDENABILITY 5 THEORETICAL J1 2 3 4 5 6 58 58 58 58 58 58 58	SPECIFICATION ASTM A255         7       8       9       10       11       12       13         58       56       55       53       51	/A304 14 15 16 18 20 49 47 46 46	22 24 26 28 3 44 41	0 32 34 39
PHYSICALS	PECIFICATION ASTM E8/A	370 AFTER HT	TREAT	š :
	2.0	IN		ran -
TENSILE (KSI) Y	IELD (KSI) & ELONGA'	FION REDUCTION	ON OF AREA	
Tensile( BATCH 1 - 157.8 BATCH 2 - 155.6 BATCH 3 - 158.2 BATCH 4 - 153.0	KSI) YIELD ELONGAT 136.1 16 133.1 17 137.7 14 133.0 14.8	ION R0A 47 (100 ) 53 (119 ) 40 (40 ba 44 (10 ba	oars) oars) ars) ars)	
REDUCTION RATIO			Q.A. BEVIEWED	
RATIO= 4.9 TO 1	. 0		DATE 7200	
SURFACE INSPECT TO AS ** MATERIAL 100% ARC FURNACE BEEN REPAIRE	TM F788/F788M-02 MELTED AND MANUFACTURI AND CONTINUOUS CASTING D BY WELDING AND THIS	ED IN THE U.S.A. METHOD. THE I MATERIAL HAS	BY THE ELEC PRODUCT HAS NOT BEEN EXP	TRIC NOT OSED

和此合为进口实现。CDI和IDAO系及自由在自由自由主要可以用的

Gerdau MacSteel Monroe 3000 East Front Street A

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Monroe MI 48



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	CERTIFIED MATERIAL	TEST REPORT	CODENCE	512
CUSTOMER ORDER NUMBER	CUSTOMER PART NUMBER	HEAT NUMBER M32854	WORK ORDER NUMBER	DATE 7/13/09
REPORT TO QUALITY ASSURANC THE DYSON CORPOR	CE RATION	Jos. Dysoi	HIP TO N & SONS INC.	
53 FREEDOM RD.	,	53 FREEDOM	1 RD.	
PAINESVILLE , OF	44077	PAINESVILI	E, OH 44077	
	. ORDEREL	)		
GRADE 4140	srze 3."		LENGTH 22' 7 3/4"	
ASTM A354-07 GRADE	CUSTOMER SPECIFICA BD; Q&T (AIM FOR 35-3	TROCKWELL C)		
ADIM MODI CO CL				
TO MERCURY TEMPERATURES	OR TO ANY OTHER METAL DURING PROCESSING OR W	ALLOY THAT I HILE IN OUR P	S LIQUID AT AME OSSESSION. **	BIENT
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	9- 10			
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			Q.A. REVIEWED DATE 772009 DYSON	
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PAGE 3 OF 3			and the solution of the soluti	NAMES AND

Gerdau:MacStrell,Monioe 30001East/Etoni/Sifeel/ Monioe: MI: 481615



A DIVISION OF J.T. ADAMS CO., INC.

4520 WILLOW PARKWAY CLEVELAND, OHIO 44125 PHONE (216) 641-3290 FAX (216) 641-1223 www.tensile.com

CERTIFIED TEST REPORT -Job No.: B0-026-232 Dyson Corporation 1 - 29 - 1053 Freedom Road Date: Cust. PO#: 70335 Painesville OH 44077 Description: 6 samples (1) 3" Dia. x 6" Lg. & (5) 3" Dia. x 1/2" Lg. SO# L102217 Code# NCJ-12 Heat# M32854 ASTM A354-07a Grade BD Spec: Caltran Special Provisions 10-1.59, 10-1.60 & 10-1.61; Plus Caltrans Standard Specifications 75-1.05 Applies **TEST RESULTS** \_\_\_\_\_ Hardness, HRC Elong., % in 4D Red. of Area, % Yield, .2% ksi Tensile, ksi 40 31 - 39 140 Req. (Min.): 55 33 159 141 16 33 33 34 34

Test Method: ASTM A370-09a

The above conforms to specifications listed.

This material tested in accordance with the Tensile Testing's Quality System Manual dated 2/15/07 Rev. D as audited and approved by Dyson. The reported results represent the actual attributes of the material tested and indicate full compliance with all applicable specification and contract requirements. We certify that the foregoing is a true copy of the data resulting from tests performed in the laboratory.

uthorized Signature

Timothy J. Adams, President



This Report May Not Be Reproduced Except In Full

Page 1 of 1 This report represents Tensile Testing interpretation of the results obtained from the test and is not to be construed as a Guaranty or Warranty of the condition of the materials tested. Tensile Testing shall not be held liable for misinterpretation of conditions, loss, damage, injury or death arising from or attributable to delay preceding a test or subsequent to performance of a test.

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		1 1	<b>'_'</b>	

Materials lechnology

1/12/2010

., . . .

Steve Marsh Dyson Corp. 53 Freedom Road 53 Freedom Rd PAINESVILLE, OH 44077-1232

Date Received: 1/7/2010

Test Report No.: DYS006-10-01-94359-2

## Stork Herron Testing Laboratories

Material Testing and Non-Destructive Testing

5405 E. Schaaf Road Cleveland, OH 44131 USA

Telephone : (216) 524-1450 Fax : (216) 524-1459 Website : www.storkherron.com

#### TEST REPORT

P.O. No.: 70023

Sample Description:

One (1) Lot (6 Pcs) 3" - 4 UNC X 21' 10 7/8" Long Double End Threaded Rods, Per ASTM A490-08a, ASTM F788, Caltran Special Provisions 10-1.59, 10-1.60 and 10-1.61, 75-1.05 apply to this work, On-Site Testing 1-7-10, Job#: L 102217

## MAGNETIC PARTICLE INSPECTION REPORT

Standard:	ASTM F788-	-06			
Procedure:	SOP 42.03	20 <b>2</b> 20			
METHOD	I				
Dry			$\boxtimes$	Wet	
PARTICLES					
Magnaflux Partic BA Red SA Black SA Black SA Gray Satch No. 07E06	les: 14A 14AM Other K	Part Preparation None Requir Solvent Clea Grinding Other	n: ed n		Wet Particle Carrier:         Magnaflux Carrier II         Pre Mixed         Concentration         Ml         Batch No.
CURRENT					
				FWDC	
Central Condu	ctor (AMPS)			Head Sho	t (AMPS)
Coil (AMPS)				Prods (AM	MPS/Spacing)
Field Verified by:	🛛 Pie Gag	e 🗌 QQI [	] Ha	II Effect Pr	obe
EQUIPMENT			12-11		
Magnaflux H-7:	20 S/N:	81471 Cal	Due	e Date:	
X Yoke X AC	DC S/N:	9438 Spacing: 4"	- 8'	Cal Due	Date: 2/11/10

The above services were performed in accordance with Herron Testing Laboratories' Quality Assurance Program Edition 1, Revision 3 dated 6/30/09. Information and statements in this report are derived from material, information and/or specifications furnished by the client and exclude any expressed or implied warranties as to the fitness of the material tested or analyzed for any particular purpose or use. This report is the confidential property of our client and may not be used for advertising purposes. This report shall not be reproduced except in full, without written approval of this laboratory. The recording of false, fictilious or fraudulent statements or entries on this document may be punished as a felony under Federal Statutes.

Sample remnants are held for a minimum of 6 months following issuance of test results, at which point they will be discarded unless notified in writing by the client. This material was not contaminated by mercury or chlorinated solvents during the handling and processing at Stork-Herron Testing Laboratories facilities.

Faula Jesar

Paula Tesar Quality Administrator
#### STORIA Materials Technology

.....

1/12/2010

Steve Marsh Dyson Corp. 53 Freedom Road 53 Freedom Rd PAINESVILLE, OH 44077-1232

Date Received: 1/7/2010

Test Report No.: DYS006-10-01-94359-2

### Stork Herron Testing Laboratories

Material Testing and Non-Destructive Testing

5405 E. Schaaf Road Cleveland, OH 44131 USA

Telephone : (216) 524-1450 Fax : (216) 524-1459 Website : www.storkherron.com

### TEST REPORT

P.O. No.: 70023

Quantity	Results	
6 PCS NCJ12 3"-4UNC-2AX21'- 10.84"	ACCEPTABLE	
Comments:		
Marking Requirements	5:	
Demag and post clear	ning requirements:	
Inspected by:		Certification: ASNI-SNI-IC-IA
Matthew Novak		

The reported results represent the actual attributes of the material tested and indicate full compliance with all applicable specification and contract requirements.

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Faula Jesar

Paula Tesar Quality Administrator



Phoenix Manufacturing, Inc. P.O. BOX 330 26666 Von Holten Rd. Cole Camp, MO. 65325 660-668-2611 660-668-3160 (fax)

SSPC-SP10 Near White Metal Blast

Near-White Blast Cleaning - Removal of nearly all mill scale, rust, rust scale, paint, or foreign matter by the use of abrasives propelled through nozzles or by centrifugal wheels. to the degree hereafter specified. A Near-White Blast Cleaned Surface Finish is defined as one from which all oil, grease, dirt, mill scale, rust, corrosion products, oxides, paint or other foreign matter have been completely removed from the surface except for very light shadows, very slight streaks or slight discolorations caused by rust stain, mill scale oxides, or light, tight residues of paint or coating that may remain. At least 95 percent of each square inch of surface area shall be free of all visible residues, and the remainder shall be limited to the light discoloration mentioned above.

DYSON	CORP	PURCHASE	ORDER	69398 3 EA NSH REPLACEME	2" ENT	4 1/2 PARTS	UNC	2	A x	110	5MM	
		PURCHASE	ORDER	70634 66 EA	3"	-4UNC	2A	x	21'-	- 10	.84"	
		PURCHASE	ORDER	70345								
				64 EA	3"	-4unc	2 A	х	22'	- 7	.73"	
				64 EA	3"	-4UNC	2 A	x	47.2	25"		
		PURCHASE	ORDER	70549					1			
				32 EA	3"	-4UNC	2 A	x	22'	-2.	81"	
				30 EA	3"	-4UNC	2 A	x	21'	-10	.84"	
				1 EA	3"	-4UNC	2 A	х	47.	25"		

1

# **Monnig Industries, Inc.**

HOT DIP & MECHANICAL GALVANIZING P.O. BOX 98 GLASGOW, MO 65254 PH. 660-338-2242 FAX: 660-338-5199

### MARCH 5, 2010

DYSON CORPORATION 50 FREEDOM ROAD PAINESVILLE, OH 44077

> RE: GALVANIZING CERTIFICATE P.O. 70549 CALTRAN RODS 32 PCS 3.00" -4UNC 2A X 22' - 2.81" LG DBL END ROD W/ 11.81" OF USEABLE THREAD EA. END 33 PCS 3.00"-4UNC 2A X 21' - 10.84" LG DBL END ROD W/ 11.81" OF USEABLE THREAD EA. END 1 PC 3.00"-4UNC 2A X 47.25" SINGLE END ROD W/ 11.81" OF USEABLE THREAD ONE END

THIS WILL CERTIFY THAT THE MATERIAL GALVANIZED ON THE ABOVE JOB MEETS OR EXCEEDS THE MINIMUM REQUIREMENTS OF ASTM A-153 SPECIFICATIONS.

MILL READINGS

4.5	5.5	4.3	6.0
4.5	5.5	5.2	7.5
5.5	4.5	3.5	4.0

PATRICIA S. WESTHUES NOTARY PUBLIC STATE OF MISSOURI HOWARD COUNTY MY COMMISSION EXP. APR. 18, 2012

,

OHN MONNIG, 1 PRESIDENT

thue

PATRICIA S. WESTHUES, NOTARY PUBLIC

## CERTIFIED MATERIAL TEST REPORT

	53 Fr Painesv	eedom l ille, OH	Road 44077		440-946 440-352	i-3500 -2700 fax	
DYSON ORDER# L 102216	دں م 660110-5	STOMER RDER# SA-017 CO13	^ 2	ITEM UMBER of 12	ouai shif 32	NTITY PPED <b>pcs</b>	DATE SHIPPED
<i>CUSTOMER</i> American Bridge / Fluor 375 Burma Road Oakland, CA 94607 USA <i>DRAWING</i>			PRODUCT DESC 3.00"-4UNC-2A w/300mm usea ASTM-A153 w galvanize. (Bio SPECIFICATION ASTM A354-07 10-1.59, 10-1.60	CRIPTION A x 22'-2.81" O able thread ea / near white r d Item 45- E2 IS 7a Grade BD r o, 10-1.61 std s	AL double ch end. HE netal blast Bearing Ar with specia	e end rod )G per prior to nchor Rod al provisions ons 75-1.05	
E2Bearing&ShearKey A	AnchorRod			Caltrans hold	points apply	this ord	er
STARTING MATERIAL Round Bar	<i>DIA</i> 3.000	GRADE BD	атү 32	LOT CODE NCJ11	HEAT NO. M32854	Oi Ge	RIGINAL MILL erdau Macsteel

The product listed above was manufactured, tested, sampled, and inspected in accordance with the specification, purchase order, and any supplementary requirements and was found to meet those requirements unless otherwise noted.

STATE OF CALIFORM	NA . DEPARTM	ENT OF TRANSPORTATION
<b>INSPECTIO</b>	N RELEA	SE TAG
FL-0624 (REV. 10/03)		
	in the second second second	A A A A A A A A A A A A A A A A A A A
STATE LOT NO.	B288	002-10 -
CONTRACT NO.	04-012	054
RELEASED (*) BY	, PS	DATE ING ING
the second se	the state of the s	SIL4110



Attachments: Mill Test Report Mechanical Test Reports N.D.E. Report Galvanizing Certification

\*

Deborah A. Smith

Q.A. Admin. Assistant

LARGE DIAMETER FASTENERS & FORGINGS / STANDARDS & SPECIALS / COMMERCIAL, MILITARY & NUCLEAR SPECIFICATIONS



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	CERTIFIED MATERIAL	TEST REPORT	CODE NCJII			
	CUSTOMER PART NUMBER	HEAT NUMBER	WORK ORDER NUMBER	DATE		
CUSTOMER ORDER NUMBER		M32854	228544 101	//13/09		
00015		SHIP TO	5	- A1		
REPORT TO			-			
QUALITY ASSURA	NCE NTTON	JOS. DYSON &	SONS INC.			
THE DISON CORP.						
53 FREEDOM RD.		53 FREEDOM F	ш.			
		PAINESVILLE	, OH 44077			
PAINESVILLE ,	OH 44077					
	ORDERE	D				
GRADE	SIZE	÷.	22! 7 3/4"			
4140	3."	ATIONS				
	CUSTOMER SPECIFIC	7 ROCKWELL C)				
ASTM A354-07 GRA			8			
8		TVOTO				
	CHEMICAL ANA	171212				
	D S Si Ni	Cr Mo	Cu Sn	Al		
C MI	P 0			9 0 020		
0.43 0.88	0.014 0.033 0.26 0.15	5 0.93 0.17	0.20 0.00	5 0.020		
v Ca	Nb					
0.010 0.0006	0.003					
CDATN ST7F	SPECIFICATION ASTM E112	2 FINE GRAD	IN 5-8			
GRAIN BIZE	_					
		AFTER HT	TREAT			
HARDNESS	SPECIFICATION ASIM EIU	111 1201 11-				
SURFACE HARDNES	S (HRC)					
BATCH 1 - 36 (	100 bars)					
BATCH 2 - 32 (	119 bars)			1		
BATCH 3 - 35 (	10 bars)					
BATCH $4 - 37$	io baib,					
		ſ	A BEVIEWED			
		ļ	DATE 7/20 09			
			DYSUN			
		l jun				
			The second s	TANK MANAGE		
PAGE 1	itvithal these data are correct and the	ompliance:with specified	Prequirements	and an arrest of the second		
C C C C C C C C C C C C C C C C C C C			5/ 1/ /c	nris Easter		
3000 East Front Street			Ausilial	The mart all sie Wal and the St		
Maarco MI/ 48161	A CALLARY STATES	AND THE REPORT OF THE PARTY OF	Quality, Assurance, Representative	相关的意义		

Montoe: MI. 48161



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	CERTIFIED MATERIAL	TEST REPORT	CODE NOT	511
CUSTOMER ORDER NUMBER	CUSTOMER PART NUMBER	HEAT NUMBER M32854	work order NUMBER	DATE 7/13/09
66015	· · · · · · · · · · · · · · · · · · ·			
REPORT TO		SHIP TO	)	
QUALITY ASSURANCE THE DYSON CORPO	CE RATION	JOS. DYSON &	SONS INC.	
53 FREEDOM RD.		53 FREEDOM R	D.	
PAINESVILLE , O	4 44077	PAINESVILLE	, OH 44077	
	ORDERE	)		
GRADE	SIZE		22' 7 <u>3/4</u> "	
4140	CUSTOMER SPECIFICA	TIONS		
ASTM A354-07 GRAD	E BD; Q&T (AIM FOR 35-3	7 ROCKWELL C)		
HARDENABILITY	SPECIFICATION ASTM A255	/A304		
THEORETICAL J1 2 3 4 5 58 58 58 58 58 58	6 7 8 9 10 11 12 13 58 58 56 55 53 51	14 15 16 18 20 49 47 46 46	22 24 26 28 3 44 41	30 32 34 39
PHYSICALS	SPECIFICATION ASTM E8/A	370 AFTER HT	TREAT	• 
	2.0	IN		
TENSILE (KSI)	YIELD (KSI) % ELONGA	TION REDUCTI	ON OF AREA	
Tensile	e(KSI) YIELD ELONGAT	ION ROA		
BATCH 1 - 157.8	136.1 16	47 (100	bars)	
BATCH 2 - 155.0	5 133.1 17	53 (119 A. (40 b	Dais)	9 6
BATCH 3 - 158.2	2 137.7 14	40 (40 D 44 (10 b	ars)	
BATCH 4 - 153.0	) 133.0 14.8			
REDUCTION RATIO			Q.A. REVIEWEI	D
RATIO= 4.9 TO	1.0		DATE 772000	
SURFACE INSPECT TO A ** MATERIAL 100 ARC FURNACE BEEN REPAIN	ASTM F788/F788M-02 D% MELTED AND MANUFACTURI AND CONTINUOUS CASTING RED BY WELDING AND THIS	ED IN THE U.S.A METHOD. THE 5 MATERIAL HAS	. BY THE ELEC PRODUCT HAS NOT BEEN EXP	TRIC NOT POSED

repleand in compliance

arecor

## PAGE 2 Serdabi Maesteel Montoer Joooreasi Front Shellor Montoe Mi 481614

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PAGE



CERTIFIED MATERIAL TEST REPORT CODE NCJI									
CUSTOMER ORDER NUMBER	CUSTOMER PART NUMBER	HEAT NUMBER M32854	WORK ORDER NUMBER         DATE           228544         101         7/13/0						
REPORT TO		<b>SHIP T</b>	D						
QUALITY ASSURANC THE DYSON CORPOR	E ATION	JOS. DYSON 8	SONS INC.						
53 FREEDOM RD.	<u>ه</u>	53 FREEDOM RD.							
PAINESVILLE , OH	44077	PAINESVILLE , OH 44077							
34	ORDERED	)							
GRADE 4140	size 3."	LENGTH 22'73/4"							
CUSTOMER SPECIFICATIONS ASTM A354-07 GRADE BD; Q&T (AIM FOR 35-37 ROCKWELL C)									

TO MERCURY OR TO ANY OTHER METAL ALLOY THAT IS LIQUID AT AMBIENT TEMPERATURES DURING PROCESSING OR WHILE IN OUR POSSESSION. \*\*

EWED 0.A. R DATE DY

ACTOCCOT OUNDWASS Drance Represented Version States with

PAGE 3 OF 3

Gerdau MacSteel Montoe 3000 East Front Sheel 5

Monroe: MIC4816



A DIVISION OF J.T. ADAMS CO., INC.

4520 WILLOW PARKWAY CLEVELAND, OHIO 44125 PHONE (216) 641-3290 FAX (216) 641-1223 www.tensile.com

CERTIFIED TEST REPORT									
Dyson Corporation 53 Freedom Road Painesville OH 44077		REF. S/O I	B0-020-935 1-22-10 70231						
Description: 6 samples (1) 3" Dia. x 6" Lg. & (5) 3" Dia. x 1/2" Lg. SO# 102215 Code# NCJ-10 Heat# M32854									
Spec:	ASTM A354- Caltran Specia Specifications	07a Grade BD al Provisions 10- 75-1.05 Applies TEST	1.59, 10-1.60 & 1 RESULTS	0-1.61; Plus Caltra	ns Standard				
<u>Tens</u> Req. (Min.):	<u>ile, ksi Yield</u> 40	<b>l<u>, .2% ksi</u> Ele</b> 115	ong., % in 4D 14	<u>Red. of Area, %</u> 40	Hardness, HRC 31 – 39				
154		132 16		55	34 34 35 34 35				
		Test Method:	ASTM A370-09a						

The above conforms to specifications listed.

This material tested in accordance with the Tensile Testing's Quality System Manual dated 2/15/07 Rev. D as audited and approved by Dyson. The reported results represent the actual attributes of the material tested and indicate full compliance with all applicable specification and contract requirements. We certify that the foregoing is a true copy of the data resulting from tests performed in the laboratory.

uthorized Signature

Timothy J. Adams, President



This Report May Not Be Reproduced Except In Full

Page 1 of 1 This report represents Tensile Testing interpretation of the results obtained from the test and is not to be construed as a Guaranty or Warranty of the condition of the materials tested. Tensile Testing shall not be held liable for misinterpretation of conditions, loss, damage, injury or death arising from or attributable to delay preceding a test or subsequent to performance of a test.

### STDIRIK Materials Technology

## 1/12/2010

Steve Marsh Dyson Corp. 53 Freedom Road 53 Freedom Rd PAINESVILLE, OH 44077-1232

Date Received: 1/7/2010

Test Report No.: DYS006-10-01-94359-3

### Stork Herron Testing Laboratories

Material Testing and Non-Destructive Testing

5405 E. Schaaf Road Cleveland, OH 44131 USA

TEST REPORT

Telephone : (216) 524-1450 Fax : (216) 524-1459 Website : www.storkherron.com

P.O. No.: 70023

Sample Description: One (1) Lot (4 Pcs) 3" - 4 UNC X 22' 2 13/16" Long Double End Threaded Rods, Per ASTM A490-08a, ASTM F788, Caltran Special Provisions 10-1.59, 10-1.60 and 10-1.61, 75-1.05 apply to this work, On-Site Testing 1-7-09, Job#: L 102216

#### MAGNETIC PARTICLE INSPECTION REPORT

Standard:	ASTM F788	-06	10	A A A A A A A A A A A A A A A A A A A		
Procedure:	SOP 42.03					
METHOD						
Dry			🛛 Wet			
PARTICLES						
Magnaflux Particles:       Part Preparation         8A Red       14A       None Requir         3A Black       14AM       Solvent Cleat         1 Gray       Other       Grinding         Batch No. 07E06K       Other       Other         CURRENT       Other       Other			n: ed n	Wet Particle Carrier: Magnaflux Carrier II Pre Mixed Concentration MI Batch No.		
AC						
Central Condu	ctor (AMPS)		Head Sho	t (AMPS)		
Coil (AMPS)		1.1114.1-1810-1414.111.1	Prods (AN	MPS/Spacing)		
Field Verified by: X Pie Gage QQI Hall Effect Probe						
EQUIPMENT						
Magnaflux H-72	0 S/N:	81471 Cal	Due Date:			
X Yoke X AC	DC S/N: 9	9438 Spacing: 4"	- 8" Cal Due	Date: 2/11/10		

The above services were performed in accordance with Herron Testing Laboratories' Quality Assurance Program Edition 1, Revision 3 dated 6/30/09. Information and statements in this report are derived from material, information and/or specifications furnished by the client and exclude any expressed or implied warranties as to the fitness of the material tested or analyzed for any particular purpose or use. This report is the confidential property of our client and may not be used for advertising purposes. This report shall not be reproduced except in full, without written approval of this laboratory. The recording of false, fictitious or fraudulent statements or entries on this document may be punished as a felony under Federal Statutes.

Faula Iwar

Sample remnants are held for a minimum of 6 months following issuance of test results, at which point they will be discarded unless notified in writing by the client. This material was not contaminated by mercury or chlorinated solvents during the handling and processing at Stork-Herron Testing Laboratories facilities. Paula Tesar Quality Administrator

# Materials Technology

1/12/2010

STORK

Steve Marsh Dyson Corp. 53 Freedom Road 53 Freedom Rd PAINESVILLE, OH 44077-1232

Date Received: 1/7/2010

Test Report No.: DYS006-10-01-94359-3

### Stork Herron Testing Laboratories

Material Testing and Non-Destructive Testing

5405 E. Schaaf Road Cleveland, OH 44131 USA

Telephone : (216) 524-1450 Fax : (216) 524-1459 Website : www.storkherron.com

### **TEST REPORT**

P.O. No.: 70023

INSPECTION RESULT	S						
Quantity	Results						
4 PCS NCJ11 3"-4UNC-2AX22'- 2.81"	ACCEPTABLE						
Comments:							
Marking Requirements:							
Demag and post cleanir	Demag and post cleaning requirements:						
Inspected by:		Certification: ASNT-SNT-TC-1A					
Matthew Novak		Level 🗌 II 🛛 🕅					

The reported results represent the actual attributes of the material tested and indicate full compliance with all applicable specification and contract requirements.

### EXPORT CONTROLLED (ITAR)

THE TECHNICAL DATA AND / OR MATERIALS ASSOCIATED WITH THIS ORDER FALLS WITHIN THE DEFINITION OF THE INTERNATIONAL TRAFFIC IN ARMS REGULATIONS (ITAR) AND IS SUBJECT TO THE EXPORT CONTROL LAWS OF THE U.S. GOVERNMENT. TRANSFER OF THIS DATA BY ANY MEANS TO A FOREIGN PERSON OR FOREIGN ENTITY, WHETHER IN THE UNITED STATES OR ABROAD, WITHOUT AN EXPORT LICENSE, ITAR EXEMPTION OR OTHER APPROVAL FROM THE U.S. DEPARTMENT OF STATE, IS PROHIBITED.

The above services were performed in accordance with Herron Testing Laboratories' Quality Assurance Program Edition 1, Revision 3 dated 6/30/09. Information and statements in this report are derived from material, information and/or specifications furnished by the client and scalening in this report are derived from material, mormation and/or specifications furnished by the client and exclude any expressed or implied warranties as to the fitness of the material tested or analyzed for any particular purpose or use. This report is the confidential property of our client and may not be used for advertising purposes. This report shall not be reproduced except in full, without written approval of this laboratory. The recording of false, fictitious or fraudulent statements or entries on this document may be punished as a felony under Federal Statutes.

Faula Ilsar

Sample remnants are held for a minimum of 6 months following issuance of test results, at which point they will be discarded unless notified in writing by the client. This material was not contaminated by mercury or chlorinated solvents during the handling and processing at Stork-Herron Testing Laboratories facilities.

Paula Tesar Quality Administrator



Phoenix Manufacturing, Inc. P.O. BOX 330 26666 Von Holten Rd. Cole Camp, MO. 65325 660-668-2611 660-668-3160 (fax)

SSPC-SP10 Near White Metal Blast

Near-White Blast Cleaning - Removal of nearly all mill scale, rust, rust scale, paint, or foreign matter by the use of abrasives propelled through nozzles or by centrifugal wheels, to the degree hereafter specified. A Near-White Blast Cleaned Surface Finish is defined as one from which all oil, grease, dirt, mill scale, rust, corrosion products, oxides, paint or other foreign matter have been completely removed from the surface except for very light shadows, very slight streaks or slight discolorations caused by rust stain, mill scale oxides, or light, tight residues of paint or coating that may remain. At least 95 percent of each square unch of surface area shall be free of all visible residues, and the remainder shall be limited to the light discoloration mentioned above

DYSON	CORP	PURCHASE	ORDER	69:	398							
				3 E	EA NSH	2"	4 1/2	UN	2 3	2A x	110	5MM
				REF	PLACEME	ENT	PARTS					
		PURCHASE	ORDER	706	534							
				66	EA	3"	-4UNC	2A	х	21'-	- 10	.84"
		PURCHASE	ORDER	703	345							
				61	E7 A	211	1	л		221	7	721
				04	БA	2	-4unc	ZA	X	22	- /	• / 5
				64	EA	3"	-4UNC	2A	х	47.2	25"	
						1000		10000000	1000 A		70.75	
		PURCHASE	ORDER	705	549							
				32	ΕA	3"	-4UNC	2A	х	22'	-2.	81"
				• •	<u></u>							
				30	ΕA	3"	-4UNC	2A	x	21'	-10	.84"
				ק (	A	3"	-4UNC	2 A	x	47.2	5 "	
						-	10110					

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# **Monnig Industries, Inc.**

HOT DIP & MECHANICAL GALVANIZING P.O. BOX 98 GLASGOW, MO 65254 PH. 660-338-2242 FAX: 660-338-5199

### MARCH 5, 2010

DYSON CORPORATION 50 FREEDOM ROAD PAINESVILLE, OH 44077

> RE: GALVANIZING CERTIFICATE P.O. 70549 CALTRAN RODS 32 PCS 3.00" -4UNC 2A X 22' - 2.81" LG DBL END ROD W/ 11.81" OF USEABLE THREAD EA. END 33 PCS 3.00"-4UNC 2A X 21' - 10.84" LG DBL END ROD W/ 11.81" OF USEABLE THREAD EA. END 1 PC 3.00" -4UNC 2A X 47.25" LG SINGLE END ROD W/ 11.81" OF USEABLE THREAD ONE END

THIS WILL CERTIFY THAT THE MATERIAL GALVANIZED ON THE ABOVE JOB MEETS OR EXCEEDS THE MINIMUM REQUIREMENTS OF ASTM A-153 SPECIFICATIONS.

MILL READINGS

4.5	5.5	4.3	6.0	
4.5	5.5	5.2	7.5	
5.5	4.5	3.5	4.0	

PATRICIA S. WESTHUES NOTARY PUBLIC STATE OF MISSOURI HOWARD COUNTY MY COMMISSION EXP. APR. 18, 2012

HN MONNIG, PRESIDENT

PATRICIA S. WESTHUES, NOTARY PUBLIC

CERTIFIED	MATERIAL	TEST	REPORT

DYSON CO	RP. NUT	E Pai	53 Freedom nesville, O⊦	Road I 44077		440-9 440-3	46-3500 52-2700 fax
DYSON OBDER#	С	USTOMER ORDER#	ŗ	'ITEM JUMBER	QUA SHI	NTITY PPED	DATE SHIPPED
L 102217	660110-	SA-017 CC	)13 3	of 12	66	pcs	2.12.10
CUSTOMER				PRODUCT DES	CRIPTION		
American Bridge / Fluo	r JV			3.00"-4UNC-24	A x 21'-10.84"	OAL dou	ble end rod
375 Burma Road				ASTM-A153 w	v/near white	metal bla	st prior to
Oakland, CA 94007				galvanize. (Bi	d Item 61- E2	Shear Ke	ey Anchor Rod
USA				SPECIFICATIO	NS	1.12	
				ASTM A354-0	7a Grade BD	with spec	ial provisions
DHAWING E2Bearing&ShearKey	AnchorRod			10-1.59, 10-1.60 Caltraps hold	o, 10-1.61 sta s	specificat	10ns 75-1.05
Lzbearing@onearicey	Anchoritod			Califants hold	pointo uppiy		
STARTING MATERIAL	DIA	GRADE	στγ	LOT CODE	HEAT NO.	C	ORIGINAL MILL
Round Bar	3.000	BD	66	NCJ12	M32854	C	Gerdau Macsteel

The product listed above was manufactured, tested, sampled, and inspected in accordance with the specification, purchase order, and any supplementary requirements and was found to meet those requirements unless otherwise noted.

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION INSPECTION RELEASE TAG TL-0624 (REV. 10/03)	STATE OF CALIFORNIA STOCK MATERIAL
STATE LOT NO. 8288 004-10	LOT NO. B208-020-10
CONTRACT NO. 04-0120F4 RELEASED (*) BY DATE JIL6/10 FM 92 1554 * Based upon selective sampling	INSPECTOR'S NAME <u>5/3</u> DATE <u>2-12-10</u>

<u>Attachments:</u> Mill Test Report Mechanical Test Report N.D.E. Report Galvanizing Certification

ALLACALLINAL

Deborah A. Smith Q.A. Admin, Assistant

ARGE DIAMETER FASTENERS & FORGINGS / STANDARDS & SPECIALS / COMMERCIAL, MILITARY & NUCLEAR SPECIFICATIONS



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### 5591 MORRILL ROAD JACKSON, MICHIGAN 49201

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	APRTICICS MATERIAL	TEST REPORT	CODE NC	512
		HEAT NUMBER	WORK ORDER NUMBER	DATE
CUSTOMER ORDER NUMBER	CUSTOMER PART HUMBER	M32854	228544 101	1/13/05
6015		снір Т	o	
REPORT TO	•			
QUALITY ASSURAN	NCE	JOS. DYSON &	SONS INC.	
THE DYSON CORPO	)RATION		חכ	
ED FREEDOM RD.		53 FREEDOM	<u>.</u>	
55 FREEDON IN		PAINESVILLE	, OH 44077	
PAINESVILLE , (	DH 44077			
	ORDERE	D	LENGTH	
CRADE	SIZE	-	22' 7 3/4"	
4140	3."	CATIONS		
	AIM FOR 35-	37 ROCKWELL C)		
ASTM A354-07 GRA				
		ALYSIS		
	CHEMICAL HE	• • • • • • • • • • • • • • • • • • •	Cu Su	Al
C MD	P S Si N	i Cr Mo	Cu Sh	
C MII	-	E 0 93 0.17	0.20 0.00	9 0.020
0.43 0.88	0.014 0.033 0.26 0.1	5 0.55		* 1
V Ca	Nb			
0.010 0.0006	0.003			
GRAIN SIZE	SPECIFICATION ASTM E11	2 FINE GRA	JIN 5-8	
HARDNESS	SPECIFICATION ASTM E10	) AFTER HI	TREAT	
SURFACE HARDNES	GS (HRC)			
BATCH 1 - 36	(100 bars) (119 bars)			ł
BATCH 2 - 32	(40 bars)			
BATCH $3 - 37$	(10 bars)		3 <b>2</b> .	
DATCH	STATE OF		Q.A. BEVIEWED	
		Under Official	DATESTOLD	
	BONG BONG	M-ACI	DATE TOUL	
	LOT NO: 15200-0	2010	Hand and the state of the state	
	NAME: 53	2-12-10		
DAGE	The second s	and the second second	edirequitements	
Weice	nifylhalihesettalajaletcorrecitantili			hisiEasleri (1951)
Gerdau:MacSteel-Monro				
3000 East Front Street			NEQUALITY ASSOCALE REPLIES CHILLIN	的过去时可是这些形式的
Methoe MI 481012 425	行为自己的 的复数 的复数 的复数 的复数 的复数 的复数 的复数 的复数 的复数 的复	ADDIAL CONTRACTOR OF A CONTRACTOR OFTA CONTRACTOR OFTA		



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## 5591 MORRILL ROAD JACKSON, MICHIGAN 49201

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		TEST REPORT	CODE NOT	512
		HEAT NUMBER	WORK ORDER NUMBER	DATE
CUSTOMER ORDER NUMBER	CUSTOMER PART NUMBER	M32854	228544 101	1/13/05
66015				
DEPORT TO		SHIP TO	)	
QUALITY ASSURANC THE DYSON CORPOR	E ATION	JOS. DYSON &	SONS INC.	
53 FREEDOM RD.		53 FREEDOM R	и).	
PAINESVILLE , OH	44077	PAINESVILLE	, OH 44077	
	ORDERE	D		
CRUDE	SIZE		221 7 3/4"	
4140	3."			
	CUSTOMER SPECIFIC	7 ROCKWELL C)		
ASTM A354-07 GRADE	BD; Qal; (AIM TOR 35			
HARDENABILITY	SPECIFICATION ASTM A255	5/A304		
THEORETICAL J1 2 3 4 5 58 58 58 58 58 58	6 7 8 9 10 11 12 13 58 58 56 55 53 51	14 15 16 18 20 49 47 46 46	22 24 26 28 44 41	30 32 34 39
PHYSICALS	SPECIFICATION ASTM E8/1	A370 AFTER HT	TREAT	
	2.0	D IN		<i>i</i> t
TENSILE (KSI)	YIELD (KSI) - & ELONG	ATION REDUCT	ION OF AREA	
Tensile BATCH 1 - 157.8 BATCH 2 - 155.6 BATCH 3 - 158.2 BATCH 4 - 153.6	e(KSI) YIELD ELONGA 136.1 16 133.1 17 2 137.7 14 0 133.0 14 148	TION ROA 47 (100 53 (119 40 (40 44 (10) STATE OF CALLE	bars) bars) bars) bars)	
REDUCTION RATIO			Q.A. REVIEW	ED
RATIO= 4.9 TO	1.0 LOT NO: NAME:	5B 2-12-10	DATE TOOL	Я
CUDENCE INSPECT TO	ASTM F788/F788M-02		A BY THE ELE	CTRIC

\*\* MATERIAL 100% MELTED AND MANUFACTURED IN THE U.S.A. BY T SURFACE INSPECT ARC FURNACE AND CONTINUOUS CASTING METHOD. THE PRODUCT HAS NOT BEEN REPAIRED BY WELDING AND THIS MATERIAL HAS NOT BEEN EXPOSED



		TEST REPORT	CODE NCT	512
CUSTOMER ORDER NUMBER	CERTIFIED MATERIAL	HEAT NUMBER M32854	WORK ORDER NUMBER	DATE 7/13/09
66015		SHIP	то	
REPORT TO QUALITY ASSURANC THE DYSON CORPOR	CE RATION	JOS. DYSON	& SONS INC.	
53 FREEDOM RD.		53 FREEDOM	RD.	
PAINESVILLE , OF	4 44077	PAINESVILLE	, on 199	
		<u>)</u>	LENGTH	
GRADE 4140	3." CUSTOMER SPECIFIC.	ATIONS	22 7 37 -	
ASTM A354-07 GRAD	E BD; Q&T (AIM FOR 35-3	7 ROCKWELL C)		
TO MERCURY TEMPERATURE	OR TO ANY OTHER METAL S DURING PROCESSING OR W	HILE IN OUR P	Q.A. REVIEWED DATE 712009 DYSON	
		LOT NO: NAME:	STATE OF CALI B208-020-10 513 2-12-	ORNIA

Gerdau:MacSteel:Mool 3000(East Front:Sireel Montoe: Mic48.605 ifiêdi

CHEFERET OF OUDDRY ASSOCIATED REDUCED THE DESCRIPTION OF A CHEFE PROVIDENT OF



A DIVISION OF J.T. ADAMS CO., INC.

4520 WILLOW PARKWAY CLEVELAND, OHIO 44125 PHONE (216) 641-3290 FAX (216) 641-1223 www.tensile.com

CERTIFIED TEST REPORT

Dyson Corporation 53 Freedom Road Painesville OH 44077

s []

B0-026-232 Job No.: 1-29-10 Date: 70335 Cust. PO#:

Description:	6 samples (1) 3" Dia. x 6" Lg. & (5) 3" Dia. x 1/2" Lg. SO# L102217 Code# NCJ-12 Heat# M32854
Spec:	ASTM A354-07a Grade BD Caltran Special Provisions 10-1.59, 10-1.60 & 10-1.61; Plus Caltrans Standard Specifications 75-1.05 Applies
	TEST RESULTS

Reg (Min):	<u>Tensile, ksi</u> 140	Yield, .2% ksi 115	<u>Elong., % in 4D</u> 14	<b><u>Red. of Area, %</u></b> 40	<u>Hardness, HRC</u> 31 – 39
Key. (wiii.).	159	141	16	55	33 33
					33 34
					34

Test Method: ASTM A370-09a

The above conforms to specifications listed.

This material tested in accordance with the Tensile Testing's Quality System Manual dated 2/15/07 Rev. D as audited and approved by Dyson. The reported results represent the actual attributes of the material tested and indicate full compliance with all applicable specification and contract requirements. We certify that the foregoing is a true copy of the data resulting from tests performed in the laboratory.

	STATE C	F CALIFOR	NIA
LOT NO:	3208-0	20-10	•
NAME:	5B	2-12-	-10

Authorized Signature

Timothy J. Adams, President



This Report May Not Be Reproduced Except In Full

This report represents Tensile Testing interpretation of the results obtained from the test and is not to be construed as a Guaranty or Warranty of the condition of the materials tested. Tensile Testing shall not be held liable for misinterpretation of conditions, loss, damage, injury or death arising from or attributable to delay preceding a test or subsequent to performance of a test.

#### STORK Materials Technology

1/12/2010

• 1

Steve Marsh Dyson Corp. 53 Freedom Road 53 Freedom Rd PAINESVILLE, OH 44077-1232

Date Received: 1/7/2010

Test Report No.: DYS006-10-01-94359-2

## Stork Herron Testing Laboratories

Material Testing and Non-Destructive Testing

5405 E. Schaaf Road Cleveland, OH 44131 USA

Telephone : (216) 524-1450 : (216) 524-1459 Fax Website : www.storkherron.com

TEST REPORT

P.O. No.: 70023

One (1) Lot (6 Pcs) 3" - 4 UNC X 21' 10 7/8" Long Double End Threaded Rods, Per ASTM A490-08a, ASTM F788, Caltran Special Provisions 10-1.59, 10-1.60 Sample Description: and 10-1.61, 75-1.05 apply to this work, On-Site Testing 1-7-10, Job#: L 102217

## MAGNETIC PARTICLE INSPECTION REPORT

Otendard	ASTM F788-06			
Standaru:	ABIMITICS			
Procedure:	SOP 42.03			
METHOD	1			
		Wet Wet		
PARTICLES	Dert Proparatio	n'	Wet Particle Carrier	:
Magnaflux Partic	14A None Requir	red	Magnaflux Carrie	r II
BA Reu	14AM Solvent Clea	an	Pre Mixed	MI
	Other Grinding		Batch No	1411
Batch No. 07E06	K D Other		Daton No.	
CURRENT				
T AC				
Central Condu	uctor (AMPS)	Head Sho	t (AMPS)	
Coil (AMPS)		Prods (AN)	MPS/Spacing)	
Field Verified by:	🛛 Pie Gage 🗌 QQI	Hall Effect Pr	obe	
FOUIPMENT				
Magnaflux H-7	720 S/N: 81471 Ca	al Due Date:		
M Voko M AC	DC S/N: 9438 Spacing: 4	4" - 8" Cal Due	Date: 2/11/10	
W TOKE W AU			s s	TATE OF CALIFORNIA

LOT NO: <u>B208-020-10</u> NAME: <u>SB</u> <u>2-12-10</u> The Faula Jear

The above services were performed in accordance with Herron Testing Laboratories' Quality Assurance Program

Edition 1, Revision 3 dated 6/30/09. Information and statements in this report are derived from material, information Edition 1, Revision 3 dated 6/30/09. Information and statements in this report are derived from material, information and/or specifications furnished by the client and exclude any expressed or implied warranties as to the fitness of the material tested or analyzed for any particular purpose or use. This report is the confidential property of our client and may not be used for advertising purposes. This report shall not be reproduced except in full, without written approval of this laboratory. The recording of false, ficilitious or fraudulent statements or entries on this document may be unliked as a felow under Enderal Statutes.

punished as a relong under rederal statutes. Sample remnants are held for a minimum of 6 months following issuance of test results, at which point they will be discarded unless notified in writing by the client. This material was not contaminated by mercury or chlorinated solvents during the handling and processing at Stork-Herron Testing Laboratories facilities. punished as a felony under Federal Statutes.

Paula Tesar Quality Administrator

## Stork Herron Testing Laboratories

STORIA Materials Technology

1/12/2010

1 1

Steve Marsh Dyson Corp. 53 Freedom Road 53 Freedom Rd PAINESVILLE, OH 44077-1232

Date Received: 1/7/2010

Test Report No.: DYS006-10-01-94359-2

Material Testing and Non-Destructive Testing

5405 E. Schaaf Road Cleveland, OH 44131 USA

Telephone : (216) 524-1450 Fax : (216) 524-1459 Website : www.storkherron.com

### TEST REPORT

P.O. No.: 70023

INSPECTION RESULT	INSPECTION RESULTS				
Quantity	Results				
6 PCS NCJ12 3"-4UNC-2AX21'- 10.84"	ACCEPTABLE				
Comments: Marking Requirements: Demag and post cleani	ing requirements:				
Inspected by: Matthew Novak	Certification: ASNT-SNT-TC-1A Level 🔲 II 🔀 III				

The reported results represent the actual attributes of the material tested and indicate full compliance with all applicable specification and contract requirements.

## EXPORT CONTROLLED (ITAR)

THE TECHNICAL DATA AND / OR MATERIALS ASSOCIATED WITH THIS ORDER FALLS WITHIN THE DEFINITION OF THE INTERNATIONAL TRAFFIC IN ARMS REGULATIONS (ITAR) AND IS SUBJECT TO THE EXPORT CONTROL LAWS OF THE U.S. GOVERNMENT. TRANSFER OF THIS DATA BY ANY MEANS TO A FOREIGN PERSON OR FOREIGN ENTITY, WHETHER IN THE UNITED STATES OR ABROAD, WITHOUT AN EXPORT LICENSE, ITAR EXEMPTION OR OTHER APPROVAL FROM THE U.S. DEPARTMENT OF STATE, IS PROHIB

STATE OF CALIFORNIA LOT NO: B208-020

<u>3 2-12-10</u> Lula Jesar

NAME:

The above services were performed in accordance with Herron Testing Laboratories' Quality Assurance Program Edition 1, Revision 3 dated 6/30/09. Information and statements in this report are derived from material, information and/or specifications furnished by the client and exclude any expressed or implied warranties as to the fitness of the material tested or analyzed for any particular purpose or use. This report is the confidential property of our client and may not be used for advertising purposes. This report shall not be reproduced except in full, without written approval of this laboratory. The recording of false, fictilious or fraudulent statements or entries on this document may be unsighted as a felore.

punished as a felony under Federal Statutes. Sample remnants are held for a minimum of 6 months following issuance of test results, at which point they will be discarded unless notified in writing by the client. This material was not contaminated by mercury or chlorinated solvents during the handling and processing at Stork-Herron Testing Laboratories facilities. Paula Tesar Quality Administrator



Phoenix Manufacturing, Inc. P.O. BOX 330 26666 Von Holten Rd. Cole Camp, MO. 65325 660-668-2611 660-668-3160 (fax)

SSPC-SP10 Near White Metal Blast

Near-White Blast Cleaning - Removal of nearly all mill scale, rust, rust scale, paint, or foreign matter by the use of abrasives propelled through nozzles or by centrifugal wheels, to the degree hereafter specified. A Near-White Blast Cleaned Surface Finish is defined as one from which all oil, grease, dirt, mill scale, rust, corrosion products, oxides, paint or other foreign matter have been completely removed from the surface except for very light shadows, very slight streaks or slight discolorations caused by rust stain, mill scale oxides, or light, tight residues of paint or coating that may remain. At least 95 percent of each square unch of surface area shall be free of all visible residues, and the remainder shall be limited to the light discoloration mentioned above.

DYSON	CORP	PURCHASE	ORDER	69: 3 H REH	398 Ea NSH Placeme	2 " ENT	4 1/2 PARTS	UNC	2 2	2A x 1105MM	
		PURCHASE	ORDER	706 66	534 EA	3 "	-4UNC	2 A	x	21'- 10.84"	
		PURCHASE	ORDER	70:	345		н.				
				64	EA	3 "	-4unc	2 A	x	22' - 7.73"	
				64	EA	3 "	-4UNC	2 A	х	47.25"	
		PURCHASE	ORDER	705	549					2	
				32	EA	3"	-4UNC	2 A	x	22' -2.81"	
				30	EA	3 "	-4UNC	2 A	x	21' -10.84"	
				1 8	ΞA	3 "	-4UNC	2 A	x	47.25"	

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# **Monnig Industries, Inc.**

HOT DIP & MECHANICAL GALVANIZING P.O. BOX 98 GLASGOW, MO 65254 PH. 660-338-2242 FAX: 660-338-5199

### MARCH 5, 2010

### DYSON CORPORATION 50 FREEDOM ROAD PAINESVILLE, OH 44077

. • • \*

### RE: GALVANIZING CERTIFICATE P.O. 70634 CALTRAN RODS 66 PCS 3.00"-4UNC 2A X 21'- 10.84" LG DBL END ROD W/ 11.81" OF USEABLE THREAD EA. END

THIS WILL CERTIFY THAT THE MATERIAL GALVANIZED ON THE ABOVE JOB MEETS OR EXCEEDS THE MINIMUM REQUIREMENTS OF ASTM A-153 SPECIFICATIONS.

MILL READINGS

4.6	5.0	4.6	
5.0	4.0	5.5	
6.2	7.2	10	
5.5	3.6	4.5	
3.5	3.2	4.0	
	4.6 5.0 6.2 5.5 3.5	4.6       5.0         5.0       4.0         6.2       7.2         5.5       3.6         3.5       3.2	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

PATRICIA S. WESTHUES NOTARY PUBLIC STATE OF MISSOURI HOWARD COUNTY MY COMMISSION EXP. APR. 18, 2012

,

HN MONNIG. PRESIDENT

thue

PATRICIA S. WESTHUES, NOTARY PUBLIC

State of California Department of Transportation

## Structural Materials Testing Laboratory 5900 Folsom Boulevard, Sacramento, CA 95819



ENCLOSE WITH SAMPLE



Caltrans Test Number:	0	Fie	ald Inspectors Fast	tener A	ssembl	y Samplir	ng Sheet	Γ
Date Sampled:	3/5/2010	Contractor:	Monnig Industries, In-	0	Bi	d Item No.:	61	
Contract: 0	04-0120F4	Location Sampled: 400	Industrial Drive, Glasgo	ow, MO	Contact:		Ryan Monnig	
CT Lot No.8	3231-015-11	Sampled By:	J Lizardo		Title:	Qua	ality Assurance	
	Inspecto	rs Office: Emeryville	Phone #: (510	) 301-1	112	Fax #:	(510) 601-1776	
R. E.'s Name: (	Gary Pursel		Co.:	SF	Rt.:	80	PM.: 13.2/	/13.9
R. E.'s Address:	333 Burma	Road	Date Rele	eased:		Ship To:	Trans Lab	
City St. Zip: 0	Oakland, Ca	а 94607	Identific	cation:		File Loc.:	1 .09	
Sample No.		2 3	4	6	7	8	6	0
Assembly or Rocap No.	N/A							
Quantity Available	96							
Number of Samples	3*			Ī				ſ
Bolt Manufacture	DYSON							
Heat Number	M32854							
Mfg. Lot Number	NCJ12							
Grade/Discription	A354 Gr. BD							
Size	8" X 21'- 10.84"							
Finish	Hot Dip Galv.							
Verify Test Reports	yes							
Pass/Fail								
Nut Manufacture	N/A							
Heat Number								
Mfg. Lot Number								
Grade								
Finish								
Verify Test Reports								
Pass/Fail			_				_	
		-	-					
Washer Manufacture	N/A							
Heat Number								
Mfg. Lot Number								
Grade								
Finish								
Verify Test Reports								
Pass/Fail								
Notes:	: *Sam	ple: 1- 3" dia. X 47 1/4" lc	ong threaded one end,	galv. ai	1d 2-3" di	a. X 12" lon	ig blank material	
1								
Note to TL-29:								7

115

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500-01

Caltrans Test Number:			Field Inspect	ctors Fastener	Assembly	y Samplir	ng Sheet	
Date Sampled:	3/5/2010	Contractor:	Monnig II	ndustries, Inc	Bic	I Item No.:	45	
Contract:	04-0120F4	Location Sampled: 4	00 Industrial [	Drive, Glasgow, MO	Contact:		Ryan Monnig	
CT Lot No.	8231-016-1	Sampled By:	JL	izardo	Title:	Qua	ality Assurar	nce
	Inspect	ors Office: Emeryville	Pho	one #: (510) 301-1	112	Fax #:	(510) 601-1	776
R. E.'s Name:	Gary Purse			Co.: SF	Rt.:	80	PM.:	13.2/13.9
R. E.'s Address:	333 Burma	Road		Date Released:		Ship To:	Trans	s Lab
City St. Zip:	Oakland, C	a 94607		Identification:		File Loc.:	1	.09
Sample No.		2 3	<u>4</u>	र्ड ि	7	30	6	10
Assembly or Rocap No.	N/A							
Quantity Available	64							
Number of Samples	3* 0							
Bolt Manufacture	DYSON							
Heat Number	M32854							
Mfg. Lot Number	NCJ10							
Grade/Discription	A354 Gr. BD							
Size	3" X 22'- 7.73"							
Finish	Hot Dip Galv.							
Verify Test Reports	yes							
Pass/Fail								
Nut Manufacture	NIA							
Heat Number								
Mfg. Lot Number								
Grade								
Finish								
Verify Test Reports		•						
Pass/Fail								
Washer Manufacture	N/A							
Heat Number								
Mfg. Lot Number								
Grade								1.
Finish								
Verify Test Reports								
Pass/Fail								
Notes:	: *Sam	ple: 1- 3" dia. X 47 1/4"	long threade	ed one end, galv. a	nd 2-3" dia	i. X 12" Ion	g blank ma	terial.
	set of sam	ple will also cover 32 p	cs. of the roc	is that have the ht	code NCJ	11 since th	ley are on t	he same bi
Note to TL-29:					- filmer			
	and the second se							

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APPROVED TOR USE BY SMTL QUALITY I. AGER & ROMEA		110	2																										
	10/233101610 Page / of /	5362/C715363 Date Rec'd. 3/9/10 Date Tested: 3/10 /	Lab Technician: FUED S		370			333			47 /		2																
PIRULIURAL MAIEKIALS IESIING LABURAIURY FORM TM- EV. 2/05)	SM Number 10 -0223 Lot Number 623101510	Contract 04-0120F4 TL-0101 Number CN5	BOILS: AZSY GRADE BD HDG	Sample No. /# 31	Mfg. Lot No. NG12	Product Markings	· Size 3 " 3 "	Pitch Diameter 2.839 1 3.8.	Bolt Length $\phi'$	Ring Gages/Go Nogo	Zine Coating Thick. 3.06 10 5.4	Hardness Rc / Rb	, Sas Wedge Tensile Sas V 50	Nuts:	Sample No.	Mfg. Lot No.	Product Markings	Size	Go / No-Go	Zinc Coating	Hardness Rc / Rb	Nut Proof Load	Washer:	Sample No.	Mfg. Lot No.	Product Markings	Zinc Coating	Hardness Rc / Rb	

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SM Number = 10-0223

.505 SAMPLES

Department of Transportation Structural Materials Testing Laboratory UTM: BALDWIN 60 Kip

Tested By	Ч	FSaylor	FSaylor	FSaylor	FSaylor	
Elongation in 4 x d	(26) Pit/a mi	17.1 AVS	13.5 OK	16.8 Ave,	13.2 OK	-
Tensile Strength	(bsi)	164690	164890 UK	164330	164080 05	
Stress at Offset	(isd)	146459	146343 UK	146139	142837 UK	
Area	(in²)	0.194	0.1971	0.1956	0.1971	
Diameter	(in)	0.497	0.501	0.499	0.501	
Heat Number		NCJ12	NCJ12	NCJ10	NCJ10	
 Sample		12A	12B	10A	10B	

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and the local division of

Thursday, March 11, 2010

Page 1 of 1

2:00 PM

TRANS	C D	RNIA · DEPARTMEN	NT OF TRAN	SPORTATION			$\cap$		S. M. NO.	100	2	DAT	E RECEIV	ED ()	6	
REPOR	AT OF	TESTS							T 101 NO.	1.1.40	2	NOS A	T. W.O.	OR P.O. N		
1L - 019 (F	06/C ./ JL								101 201 201 201 201 201 201 201 201 201	10/01	21611	EALF	0- 4-0	106	+	
TEST NAME						DISTRICT	COUN	۲۲ ۲	ROUTE	nata	000	POS	T MILES			
CONTRACT	OR					SAMPLED BY	_		DATE SAMPLE			SUP	PLY SOUF	RCE		
AGENCY						MANUFACTUR	IER		MATERIAL TES	TED FOR		_				
SAMI	PLE	HEAT NO.	SIZE	ARI	EA	VIELD	-MPar	ULT	IMATE PSI	ELONG.	RED. CC		CHEMIC/	IL ANALYS	<u>s</u>	V
NO.	TYPE			BEFORE	AFTER	ACTUAL	ISA	ACTUAL	WPar	*	AREA BE %	C C	WW	P S	IS	E E
13A		KILDN	234.	3.0385	2,3755		146459		164690	1.77						
120		KUSIZ	- 501	3.0285	2.3030		146343		164850	13.5						
IDM		NCJIQ	53.7.	2.0285	2.3685		146139		164330	16.8						
901		NCJIO	,501	2.0385	3.3965		142.837		164680	13.2						
											-	-				
												-				
SPECIFICA	TIONS	- CT									-	-		-		
REMARKS	1	1254 1	20													
DATE TEST	ED / 1	4	TESTED BY	S/					APPROVED	BΥ						
FM 3018 M 9	102	010	X	sel a	Tary W											

STRUCTUR MATERIALS TESTING LABORATC FORM TL-652 (REV. 3/05)	DRY TEST SI	CIMEN PREPARAT AND RECORD	ION APPROVED FOR BY SMTL QUALITY MANAGER: 8) BORGA
SM No.	Contract No.	Requesting Lab Techniciar	Date Needed
10-0223	04-0120F4	F Saylor	normal
TL-0101 No.	E.A./Spec. Desg./Object	Date Received	Date Tested/Provided
C715362	04-0120F3	3/9/10	3/10/10
[ x ] Machine Shop			[ ] Chemistry Lab
Work Requested	Please Machine .505		type of material:
[ x ] standard round tension test specimen, circle one: 0.500" 0.350" 0.250"	Lot #NCJ12, mark 12 A &	ß	Work Requested
<ol> <li>standard rectangular tension test specimen, circle one: 18" long, 8" gage length 8" long, 2" gage length</li> </ol>	Lot #NCJ10 , Mark 10 A 8	Ш	<ul> <li>I neoprene verification</li> <li>oil swell</li> <li>zinc coating weight</li> </ul>
[] Charpy, circle one: 10mm x 10mm 10mm x 7.5mm			[] steel chemistry analysis
[] hardness measurement sample (fasteners)			← [ ] see instructions
[] weld nugget			[] Other (overlain)
[] chemistry slug			
[] other:hardness			
[ x ] see instructions $\rightarrow$			
· · · · · · · · · · · · · · · · · · ·			
Comments or further instructions		The received service is accept	able
		100	
		Receiving Lab Technici	an 3/10/10 Date

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A .500 B 505

NOTES / SPECIAL INSTRUCTIONS



X	.500 ±.00
	.350 ±.007
	OTHER

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 А	.501	
В	.504	

NOTES / SPECIAL INSTRUCTIONS