

CONTRACTOR OUT REACH MEETING

FALSEWORK ISSUES

PRESENTED BY : AJAY SEHGAL,
FALSEWORK SPECIALIST

Shu Ching agreed with Boethuis, both said
“For changing people’s manners and altering their customs
there is nothing better than music.”

CALTRANS believes that communication at each level with the
contractor can alter /improve our procedure & processes
(manner & customs) to build bridges safely and economically!

OVERVIEW

- FALSEWORK ISSUES
 - A. Use of winches
 - B. Falsework Traffic Openings
 - C. Sand Jacks
 - D. FW jacking Operations
 - E. Closure windows
 - F. Guidelines for Lane closure charts

FALSEWORK ISSUES

FALSEWORK REMOVAL WITH WINCHES



FALSEWORK ISSUES

WHY WINCH SPECIFICATION NEEDED FOR FALSEWORK REMOVAL?

- Winches are being used statewide without any official guidance or specifications
- Need specifications that will allow safe falsework removal using winches

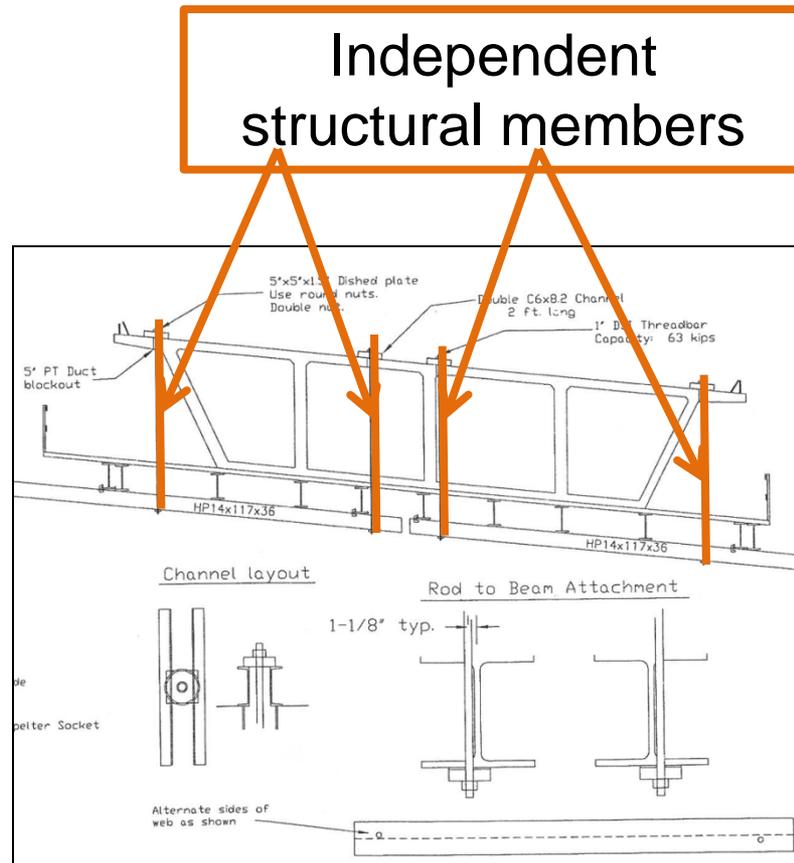
ADVISORY TEAM RECOMMENDED

1. Write Standard specifications for falsework removal with winches
2. Sample calculations for checking overturning of winches

FALSEWORK ISSUES

What is in Draft Standard Specifications

I. Independent support system:



What is in Draft Standard Specifications

II. Shop drawing and calculations must include the following

1. Design code used for the analysis of the structural members of the independent support system.
2. Provisions for complying with current Cal/OSHA requirements.
3. Load tests and ratings within 1 year of intended use of strand jacks and winches.
4. Location of the winches, prestressed strand jacks, high strength rod, or cranes.
5. Analysis showing that the bridge deck and overhang are capable of supporting all loads at all time.

What is in Draft Standard Specifications

II. Shop drawing and calculations must include the following

6. Analysis showing that winches will not overturn or slide during all stages of loading.
7. Location of deck and soffit openings if needed.
8. Details of repair for the deck and soffit openings after falsework removal.
9. Analysis showing that the load imposed on the deck does not exceed the design capacity of the deck.

DRAFT SPECIFICATIONS REQUIREMENTS:

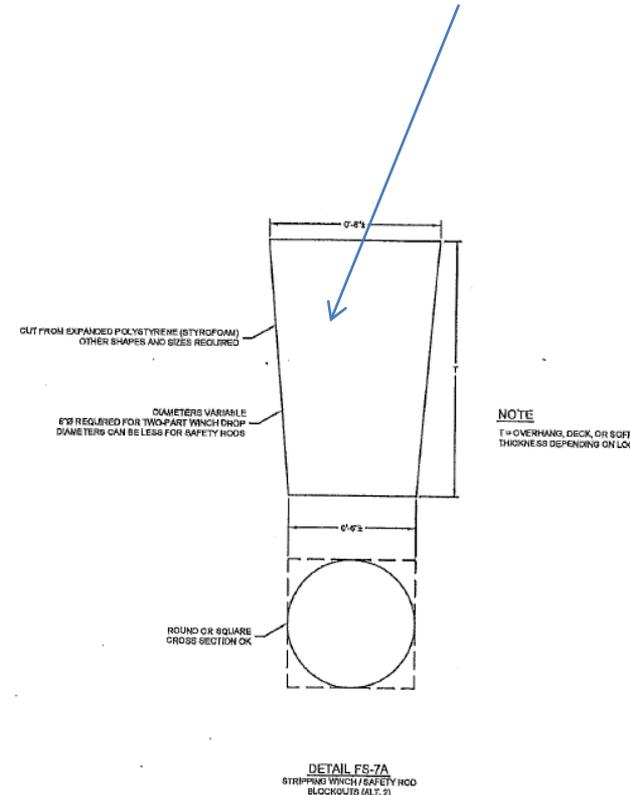
Deck hole

III. Deck Hole Requirements

- Preformed hole (5" max top & 3" max bottom conical wedge shape)
- Deck holes be away from wheel lines

IV. Deck Hole Patching requirements

- Clean & roughen holes
- Use non-shrink rapid setting concrete



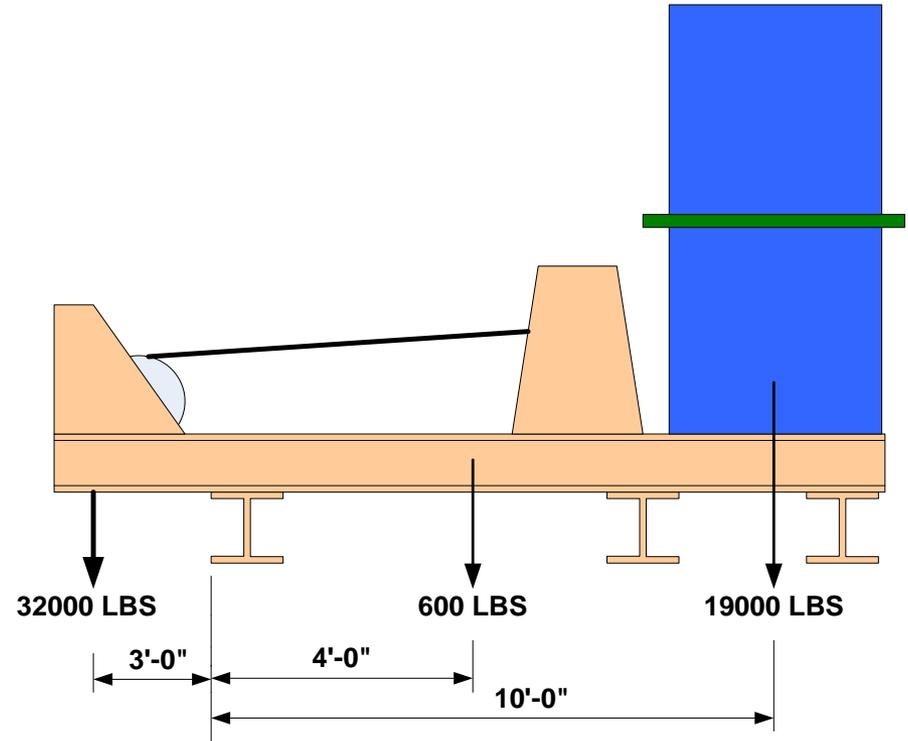
DRAFT SPECIFICATIONS REQUIREMENTS:

V. Soffit Hole requirements

- Anchor bird screen
- ½ inch drip groove to the outside soffit holes

UP-COMING MANUAL REVISION:

1. Sample overturning check for the winches



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B. Falsework Traffic Openings

Issue: Due to longer horizontal and tight vertical clearances contractors are required to do special design to meet both horizontal and vertical clearances. Contractors are asking for relief.

Contractor's request:

1. Can bridges be designed with higher vertical clearance ?

Contractor's question:

1. Are the future widening considered when minimum clearance are determined for new structures across freeways, local streets and railroads?

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B. Falsework Traffic Openings

CALTRANS RESPONSE:

Response from in-charge of Geometric Design standard awaited.

Observation:

1. Vertical clearance is an issue for widening on the lower side of the bridge only
2. Generally, it may not be an issue for original construction .
But sometimes existing local street control the vertical profile.

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C. Wood sand jacks

Background: Sand jacks were used without any known testing for long time prior to UC San Diego research

Why did we need FW memo C-18 ?

- II. With longer traffic openings, taller and larger wood sand jacks were used without approved testing guidelines
- II. Few failure occurred due to bending of bottom plywood sitting on top of poor quality corbel or corbel with rounded corners.
- II. Few contractors performed wood sand jack testing but without any well defined failure criteria

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C. Wood sand jacks

Currently, FW Memo C-18 allows contractors two options:

I. Pre-Approved Wood Sand Jack

The wood sand jack with two steel bands as depicted in Figure C-18-3 has been reviewed and is approved for use in falsework construction and removal.

II. Proof Testing required for wood sand jacks that deviate from pre-approved sand jacks

FALSEWORK ISSUES

C. Wood sand jacks

What is the basis of FW Memo C-18 ?

Pre-Approved Wood Sand Jack is based on research done by UC San Diego

Are there any proof testing guidelines in FW Memo C-18 ?

Yes, there are Proof Testing Guidelines that must be followed for wood sand jack that deviated from pre-approved sand jacks

FALSEWORK ISSUES

C. Wood sand jacks

FW Memo C-18 Key items pertaining to Proof Testing

- Sand jack failure is defined as the load at which it settles $\frac{3}{4}$ ".
With FOS=2 a sand jack will settle about $\frac{1}{2}$ ".

Basis for Failure criteria:

- Per Std Specs total FW settlement allowed = 1"
- A reasonable portion of 1" can only be attributed to the sand jack

FALSEWORK ISSUES

C. Wood sand jacks

Under consideration are following items:

- Redefine Sand Jack failure load to be equal to load at 1" settlement in lieu of $\frac{3}{4}$ "
- The proposed sand jack must be able to maintain the design load (in lieu of 2x design load) with less than $\frac{1}{16}$ " increase of vertical displacement over 20 minutes.
- Revisit plastic requirement in the wood sand jack

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D. Jacking Operations

Contractor's question:

1. What is being done to better ensure stability of falsework system when jacking ?

CALTRANS Response:

1. Various contractors use brackets to “restrain” the bottom cap as the falsework is jacked.
2. Some “strut” between adjacent bents at the bottom during jacking operations.

Observation:

1. Standard specifications limits the amount of jacking over roadways especially when longitudinal bracing needs to be released

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E. Freeway closure windows to set falsework

Contractors have issue with restrictive freeway & lane closure windows (4 to 5 hrs) as well as the number of times allowed to do closure.

CALTRANS Response:

1. Traffic Operations will provide the basis of setting these time limits.

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F. Need basis of Lane closure time limits

Contractor's question:

1. What are the parameters for determining the length of closure and number of closures for FW operation

CALTRANS Response:

1. Note sent to Traffic Operations if this can be addressed at the Department level rather than at District level
2. Some of the parameters are as follows:
 - Traffic counts
 - Time delay study (Not more than 30 min acceptable)

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F. Need basis of Lane closure time limits, continues

CALTRANS Response continued:

Under consideration:

1. Increase length of a traffic window can be considered on a project by project basis

Observation:

If more hours are provided for closure then both public and contractors complaints increase.