SPAN LOCKS RESEARCH CONCEPTS SUMMARY (OUTLINE OF DRAFT REPORT)

1. Tapered Lock Bar with Spherical Receiver
   A. Concept Description: (ADD DETAILED DESCRIPTION)
      i. Based on existing tapered lock bars
      ii. Improvements:
      iii. Hydraulic jacks added to forward and rear guides allow for relaxed tolerance during installation compared with conventional lock bar
      iv. Spherical Receiving Socket allows for leaf tip rotation
   B. Advantages:
   C. Disadvantages:
   D. Evaluation Summary:
      i. Effectiveness:
      ii. Maintenance:
      iii. Emergency Disengagement Procedures:
      iv. Constructability:
      v. Durability:
      vi. Cost:

2&3. Pincer & Jaw Lock Bars
   A. Concept Description: (ADD DETAILED DESCRIPTION)
      i. Conceptually similar to historic pincer and jaw span locks
      ii. Increased spacing of forward guide shoes allows for relaxed tolerance during installation
      iii. Single sided wedges drive respective bars into contact with forward guide shoes and receiver
      iv. Allows for continuous operation with uneven wear
   B. Advantages:
   C. Disadvantages:
   D. Evaluation Summary:
      vii. Effectiveness:
      viii. Maintenance:
      ix. Emergency Disengagement Procedures:
x. Constructability:
xi. Durability:
xii. Cost:

4. Friction Lock
A. Concept Description: (ADD DETAILED DESCRIPTION)
   i. Based on transmission clutch
   ii. Engages both sides of bascule girder
   iii. Uses 8 total smaller lock bars
   iv. Floating spacers between lock bars allow for relaxed tolerance during installation
   v. Hydraulic jacks engage spacers and lock bars into place
   vi. Utilizes combined frictional force of all surfaces
A. Advantages:
B. Disadvantages:
C. Evaluation Summary:
   i. Effectiveness:
   ii. Maintenance:
   iii. Emergency Disengagement Procedures:
   iv. Constructability:
   v. Durability:
   vi. Cost:

5. Clamping Lock
A. Concept Description: (ADD DETAILED DESCRIPTION)
   vii. Based on conventional lock bars
   viii. Hydraulic jacks incorporated into guides and receivers allow for relaxed tolerance during installation
   ix. Springs allow for slight leaf tip deflections
B. Advantages:
C. Disadvantages:
D. Evaluation Summary:
   vii. Effectiveness:
   viii. Maintenance:
ix. Emergency Disengagement Procedures:

x. Constructability:

xi. Durability:

xii. Cost:

6. Fin Brake

A. Concept Description: (ADD DETAILED DESCRIPTION)

x. Based on disc brake design

xi. Barrier mounted above existing bascule girders

xii. Frictional force of brake pads on fin receiver hold bridge in place

xiii. Clamping force provided and relieved by springs or hydraulic jacks

B. Advantages:

C. Disadvantages:

D. Evaluation Summary:

xiii. Effectiveness:

xiv. Maintenance:

xv. Emergency Disengagement Procedures:

xvi. Constructability:

xvii. Durability:

xviii. Cost:

7. Spherical Pivot Lock

A. Concept Description: (ADD DETAILED DESCRIPTION)

i. Spherical pivoting receiving socket allows for tip rotation

ii. Hydraulically actuated lock bar forces and locks leaves into vertical alignment
B. Advantages:
C. Disadvantages:
D. Evaluation Summary:
   i. Effectiveness:
   ii. Maintenance:
   iii. Emergency Disengagement Procedures:
   iv. Constructability:
   v. Durability:
   vi. Cost:

8. **Cam Lock**
   A. Concept Description: (ADD DETAILED DESCRIPTION)
      i. Actuated by rotation
         ii. Sliding contact with cam receiver forces bridge into vertical alignment
   B. Advantages:
   C. Disadvantages:
   D. Evaluation Summary:
      i. Effectiveness:
      ii. Maintenance:
      iii. Emergency Disengagement Procedures:
      iv. Constructability:
      v. Durability:
      vi. Cost:

9. **Internally Expanded Lock Bar**
   A. Concept Description: (ADD DETAILED DESCRIPTION)
      i. EHM design – permission to evaluate during study
ii. Hydraulic jacks within lock bar expands steel plates to allow for relaxed tolerance during installation

B. Advantages:
C. Disadvantages:
D. Evaluation Summary:
   vii. Effectiveness:
   viii. Maintenance:
   ix. Emergency Disengagement Procedures:
   x. Constructability:
   xi. Durability:
   xii. Cost:

10. Moment Lock Bar
A. Concept Description: (ADD DETAILED DESCRIPTION)
   i. Forward and Rear receiving guides transfer moment through lock bar
   ii. Stiffens bascule girder and significantly decreases leaf deflections

B. Advantages:
C. Disadvantages:
D. Evaluation Summary:
   i. Effectiveness:
   ii. Maintenance:
   iii. Emergency Disengagement Procedures:
   iv. Constructability:
   v. Durability:
   vi. Cost:
TAPERED LOCKBAR with SPHERICAL RECEIVER
PINCER LOCK
FRICTION LOCK
SPHERICAL PIVOT LOCK
INTERNALLY EXPANDING
INTERNALLY EXPANDING
SECTION D-D
SCALE 1 : 5

INTERNALLY EXPANDING

VIEW F
SCALE 1 : 5

CUSTOMER: FDOT
PROJECT: SPAN LOCK DESIGN
TITLE: LOCK BAR
PI: 465-10.2.2(A)
DRAWING NO: CONCEPT 4
APP'D BY: SRH
CHECKED BY: MH
DRAWN BY: GD
SCALE: 1 : 5
DATE: 10/17/2011
REV: D

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