

**FOR CONTRACT NO.: 06-0L3904**

# **INFORMATION HANDOUT**

## **AGREEMENTS**

UNITED STATES FISH AND WILDLIFE SERVICE

81420-2011-I-0527-1

## **MATERIALS INFORMATION**

**INSTALLATION DETAILS FOR BATTERY BACKUP SYSTEM**  
(BBS Cabinet mounting details and wiring details)

**ALTERNATIVE CRASH CUSHION SYSTEM**

**ROUTE: 06-Ker-99-PM 24.6**



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office  
2800 Cottage Way, Room W-2605  
Sacramento, California 95825-1846

In Reply Refer To:  
81420-2011-I-0527-1

**JAN 19 2012**

Mr. Frank Meraz  
Interim Branch Chief, Central Region Biology  
California Department of Transportation, District 6  
855 M Street, Suite 200  
Fresno, California 93721

Subject: Informal Consultation on the California Avenue On-Ramp Project in Kern County, California (California Department of Transportation EA 06-0L390K, 06-KER-99-PM 24.6)

Dear Mr. Meraz:

This is the U.S. Fish and Wildlife Service's (Service) response to the California Department of Transportation's (Caltrans) request for concurrence on the proposed California Avenue On-Ramp Project (project) in Kern County, California. Under the provisions of the July 1, 2007, Pilot Program Memorandum of Understanding between the Federal Highway Administration (FHWA) and Caltrans, FHWA assigned, and Caltrans assumed, FHWA's responsibilities under the National Environmental Policy Act (NEPA) as well as its responsibilities for environmental review, consultation, and coordination under other Federal environmental laws. Your letter, dated April 27, 2011, was received in this office on April 29, 2011. At issue are the effects of this proposed project on the federally-endangered San Joaquin kit fox (*Vulpes macrotis mutica*). Caltrans has determined that the proposed project may affect, but is not likely to adversely affect the species, and requests concurrence with this determination. This response was prepared in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

The findings and recommendations of this letter are based on: (1) Caltrans' April 27, 2011, letter requesting concurrence; (2) accompanying mapping showing the project location and areas of potential effects; (3) electronic-mail (e-mail) correspondence between the Service and Caltrans from May and June 2011; and (4) other information available to the Service.

### **Project Description**

Caltrans proposes to improve the safety of the westbound California Avenue on-ramp at post-mile 24.6 in Bakersfield, California by adding a new right-turn lane leading onto southbound State Route (SR) 99. The existing westbound California Avenue slip on-ramp will be removed

and replaced with the new right-turn lane, which will end at the existing signalized intersection with Real Road. Caltrans also proposes to add a new channelizing island to separate the through-traffic entering the on-ramp from both westbound and eastbound California Avenue. The existing channelized island will be cut to accommodate widening; with the creation of a 50 foot (ft.) radius, the new lane alignment will meet Surface Transportation Assistance Act (STAA) truck turning requirements. This will improve traffic control, lengthen the lane segment for vehicle merging, and slow traffic speeds coming from westbound California Avenue. Additionally, a proposed maintenance vehicle pull-out (MVP) area will be located adjacent to the proposed shoulder and new on-ramp entrance.

No new right-of-way (ROW) acquisition will be necessary. The project will require two nights of work along California Avenue for cold-planing the pavement; no night work will be conducted off the existing pavement. Fill material will be essential for providing the longer transition lane onto the existing southbound on-ramp and for flattening the existing shoulder to meet the current Caltrans standard. An existing drainage basin in the loop area may also need to be reconstructed away from the newly constructed side slope. A portion of the inner on-ramp loop area will be needed to provide shallower side slopes and to relocate the existing drainage basin.

The project is anticipated to begin June 1, 2013 and reach completion by June 1, 2014; the schedule will be continuous with the exception of a winter suspension due to weather conditions. Staging will be located inside the loop of the southbound on-ramp, most likely in the area adjacent to the proposed MVP. The access route will be the area between the southbound on-ramp entrance and inner loop. The ramp will be closed during construction.

#### Action Area

The action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the proposed project, the action area consists of the westbound California Avenue entrance and on-ramp hardscape, the channelizing island, and the ruderal/disturbed land located within the on-ramp loop. This is a ruderal area in which activities attributed to new lane alignment will occur and in which potential equipment access routes and staging areas will likely be located.

#### Proposed Avoidance and Minimization Measures

According to the request letter and further discussion with Caltrans, Caltrans proposes to implement the following measures to minimize and avoid impacts to the San Joaquin kit fox.

1. Pre-construction surveys within the project limits will be conducted no more than 30 calendar days prior to the start of construction in accordance with the Service's most recent available guidelines; currently, this is the revised 2011 *Standard Measures for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance Construction and Operation Requirements*. Surveys will involve walking the project limits and adjacent areas accessible to the public to determine San Joaquin kit fox presence (e.g. dens and related sign).

2. An employee education program will be conducted by a Service-approved biologist for all construction personnel prior to ground-breaking; the program will consist of a description of the San Joaquin kit fox and its habitat needs, the status of the species and its protection under the Act, the conservation measures taken to reduce and avoid impacts to the species, and the penalties for not complying with biological minimization requirements. Training will be repeated for all new personnel before they access the project site.
3. Project-related vehicles will observe a 20 mile-per-hour speed limit in all project areas. Vehicle travel will be limited to established roadways.
4. Since the San Joaquin kit fox is most active at night, construction activities will occur during the day, with the exception of ~~two~~ <sup>twelve</sup> nights required for cold-planing the pavement.
5. All food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in closed containers and removed daily from the entire project site in order to reduce the potential for attracting scavengers and predator species.
6. To prevent the inadvertent entrapment of the San Joaquin kit fox or other species during construction, all excavated, steep-walled holes or trenches more than two feet deep will be covered at the close of each work day or provided with escape ramps constructed of fill or wooden planks. Prior to any holes or trenches being filled, they will be thoroughly inspected for trapped individuals.
7. Since the San Joaquin kit fox is also attracted to den-like structures such as pipes and may enter them becoming trapped or injured, all construction pipes, culverts, or similar structures with a diameter of four inches or greater stored on-site will also be inspected for the San Joaquin kit fox prior to the structures being buried, capped, or moved. If a San Joaquin kit fox is discovered, that section of pipe will not be moved until the Service and the California Department of Fish and Game (CDFG) have been consulted and the San Joaquin kit fox is allowed to leave without harassment.
8. If a San Joaquin kit fox den is discovered during construction, all work activity within a 150 ft. radius of the den will be halted and the Resident Engineer will be immediately contacted. The Service and the CDFG will be contacted for guidance as soon as possible.

#### Determination

Caltrans has determined that the proposed project is unlikely to adversely affect the San Joaquin kit fox. Project activities fall within the boundaries of the ROW on existing hardscape and on heavily disturbed ruderal land located within a busy freeway on-ramp loop. According to the California Natural Diversity Database (CNDDB, 2011)<sup>1</sup>, there are 14 records of the San Joaquin

<sup>1</sup> California Natural Diversity Database (CNDDB). 2011. Natural Heritage Division, California Department of Fish and Game. RareFind 4. Accessed June 1, 2011. Sacramento, California.

kit fox within the Gosford United States Geological Survey 7.5-minute quadrangle, within which the project action area is located. One observation from 2006 is situated within one and one half miles of the action area; two further observations from 2004 and 2006 are located within two and one half miles of the action area. Caltrans biologists conducted recent surveys of the action area on April 6, 2011. The study area and a surrounding 300 foot buffer were walked on a combination of north/south and east/west transects so as to ensure 100 percent visual coverage. According to Caltrans, the study area was found to be highly urbanized and disturbed, comprised of roadway hardscape and commercial areas with weedy non-native vegetation and landscaped ornamental vegetation, which do not provide high quality habitat for the San Joaquin kit fox. No signs of potential dens or scat were detected during the survey.

Because the San Joaquin kit fox is known to inhabit and utilize lands adjacent and in proximity to the action area (e.g. according to CNDDDB records and other known occurrences/dens identified in the 2010 *Draft Thomas Roads Improvement Program San Joaquin Kit Fox Effects Analysis, Mitigation Strategy, and Implementation Plan*, prepared for a separate collection of Caltrans projects in the Bakersfield area), and there is some minimally suitable denning habitat on the embankments located within the on-ramp loop, it is possible that the San Joaquin kit fox may occur in the action area. A portion of the dirt slope immediately inside the on-ramp loop will be converted to hardscape as a result of lane widening at the transition area, while the area inside the loop adjacent to the on-ramp entrance to be used for staging and access will experience some temporary disturbance. However, given the relatively small-scale scope of work and the existing habitat conditions, along with the implementation of the proposed conservation measures, any effects to the San Joaquin kit fox will be insignificant or discountable.

After reviewing Caltrans' request letter, mapping, and other information sources, and discussing project aspects and avoidance and minimization measures with Caltrans, the Service concurs with the determination that the proposed project is not likely to adversely affect the San Joaquin kit fox.

### **Closing Statement**

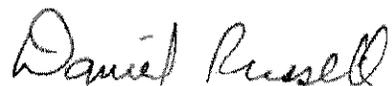
This concludes the Service's review of the proposed California Avenue On-Ramp Project and its consideration of the project's effects to the species. No further coordination with the Service under the Act is necessary at this time. Please note, however, that take of listed species is not exempted from the prohibitions described under section 9 of the Act. We concur that the project as proposed is not likely to result in take, but if conditions change so that the project may adversely affect listed species, initiation of formal consultation, as provided in 50 CFR § 402.14, is required.

Mr. Frank Meraz

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Please contact Jen Schofield or Thomas Leeman, San Joaquin Valley Division Chief, at (916) 414-6600 if you have any questions regarding this letter.

Sincerely,

A handwritten signature in black ink that reads "Daniel Russell". The signature is written in a cursive style with a large, prominent "D" and "R".

Daniel Russell  
Deputy Assistant Field Supervisor

cc:

Ms. Annee Ferranti, CDFG, Fresno, California



**U.S. FISH AND WILDLIFE SERVICE  
STANDARDIZED RECOMMENDATIONS  
FOR PROTECTION OF THE ENDANGERED SAN JOAQUIN KIT FOX  
PRIOR TO OR DURING GROUND DISTURBANCE**

Prepared by the Sacramento Fish and Wildlife Office  
January 2011

## INTRODUCTION

The following document includes many of the San Joaquin kit fox (*Vulpes macrotis mutica*) protection measures typically recommended by the U. S. Fish and Wildlife Service (Service), prior to and during ground disturbance activities. **However, incorporating relevant sections of these guidelines into the proposed project is not the only action required under the Endangered Species Act of 1973, as amended (Act) and does not preclude the need for section 7 consultation or a section 10 incidental take permit for the proposed project.** Project applicants should contact the Service in Sacramento to determine the full range of requirements that apply to your project; the address and telephone number are given at the end of this document. Implementation of the measures presented in this document may be necessary to avoid violating the provisions of the Act, including the prohibition against "take" (defined as killing, harming, or harassing a listed species, including actions that damage or destroy its habitat). These protection measures may also be required under the terms of a biological opinion pursuant to section 7 of the Act resulting in incidental take authorization (authorization), or an incidental take permit (permit) pursuant to section 10 of the Act. The specific measures implemented to protect kit fox for any given project shall be determined by the Service based upon the applicant's consultation with the Service.

The purpose of this document is to make information on kit fox protection strategies readily available and to help standardize the methods and definitions currently employed to achieve kit fox protection. The measures outlined in this document are subject to modification or revision at the discretion of the Service.

## IS A PERMIT NECESSARY?

**Certain acts need a permit from the Service which includes destruction of any known (occupied or unoccupied) or natal/pupping kit fox dens.** Determination of the presence or absence of kit foxes and /or their dens should be made during the environmental review process. All surveys and monitoring described in this document must be conducted by a qualified biologist and these activities do not require a permit. A qualified biologist (biologist) means any person who has completed at least four years of university training in wildlife biology or a related science and/or has demonstrated field experience in the identification and life history of the San Joaquin kit fox. In addition, the biologist(s) must be able to identify coyote, red fox,

gray fox, and kit fox tracks, and to have seen a kit fox in the wild, at a zoo, or as a museum mount. Resumes of biologists should be submitted to the Service for review and approval prior to any survey or monitoring work occurring.

### **SMALL PROJECTS**

Small projects are considered to be those projects with small foot prints, of approximately one acre or less, such as an individual in-fill oil well, communication tower, or bridge repairs. These projects must stand alone and not be part of, or in any way connected to larger projects (i.e., bridge repair or improvement to serve a future urban development). The Service recommends that on these small projects, the biologist survey the proposed project boundary and a 200-foot area outside of the project footprint to identify habitat features and utilize this information as guidance to situate the project to minimize or avoid impacts. If habitat features cannot be completely avoided, then surveys should be conducted and the Service should be contacted for technical assistance to determine the extent of possible take.

Preconstruction/preactivity surveys shall be conducted no less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities or any project activity likely to impact the San Joaquin kit fox. Kit foxes change dens four or five times during the summer months, and change natal dens one or two times per month (Morrell 1972). Surveys should identify kit fox habitat features on the project site and evaluate use by kit fox and, if possible, assess the potential impacts to the kit fox by the proposed activity. The status of all dens should be determined and mapped (see Survey Protocol). Written results of preconstruction/preactivity surveys must be received by the Service within five days after survey completion and prior to the start of ground disturbance and/or construction activities.

**If a natal/pupping den is discovered within the project area or within 200-feet of the project boundary, the Service shall be immediately notified and under no circumstances should the den be disturbed or destroyed without prior authorization. If the preconstruction/preactivity survey reveals an active natal pupping or new information, the project applicant should contact the Service immediately to obtain the necessary take authorization/permit.**

If the take authorization/permit has already been issued, then the biologist may proceed with den destruction within the project boundary, except natal/pupping den which may not be destroyed while occupied. A take authorization/permit is required to destroy these dens even after they are vacated. Protective exclusion zones can be placed around all known and potential dens which occur outside the project footprint (conversely, the project boundary can be demarcated, see den destruction section).

## OTHER PROJECTS

It is likely that all other projects occurring within kit fox habitat will require a take authorization/permit from the Service. This determination would be made by the Service during the early evaluation process (see Survey Protocol). These other projects would include, but are not limited to: Linear projects; projects with large footprints such as urban development; and projects which in themselves may be small but have far reaching impacts (i.e., water storage or conveyance facilities that promote urban growth or agriculture, etc.).

The take authorization/permit issued by the Service may incorporate some or all of the protection measures presented in this document. The take authorization/permit may include measures specific to the needs of the project and those requirements supersede any requirements found in this document.

## EXCLUSION ZONES

In order to avoid impacts, construction activities must avoid their dens. The configuration of exclusion zones around the kit fox dens should have a radius measured outward from the entrance or cluster of entrances due to the length of dens underground. The following distances are **minimums**, and if they cannot be followed the Service must be contacted. Adult and pup kit foxes are known to sometimes rest and play near the den entrance in the afternoon, but most above-ground activities begin near sunset and continue sporadically throughout the night. Den definitions are attached as Exhibit A.

Potential den**	50 feet
Atypical den**	50 feet
Known den*	100 feet
Natal/pupping den (occupied <u>and</u> unoccupied)	Service must be contacted

**\*Known den:** To ensure protection, the exclusion zone should be demarcated by fencing that encircles each den at the appropriate distance and does not prevent access to the den by kit foxes. Acceptable fencing includes untreated wood particle-board, silt fencing, orange construction fencing or other fencing as approved by the Service as long as it has openings for kit fox ingress/egress and keeps humans and equipment out. Exclusion zone fencing should be maintained until all construction related or operational disturbances have been terminated. At that time, all fencing shall be removed to avoid attracting subsequent attention to the dens.

**\*\*Potential and Atypical dens:** Placement of 4-5 flagged stakes 50 feet from the den entrance(s) will suffice to identify the den location; fencing will not be required, but the exclusion zone must be observed.

Only essential vehicle operation on existing roads and foot traffic should be permitted. Otherwise, all construction, vehicle operation, material storage, or any other type of surface-disturbing activity should be prohibited or greatly restricted within the exclusion zones.

### **DESTRUCTION OF DENS**

Limited destruction of kit fox dens may be allowed, if avoidance is not a reasonable alternative, provided the following procedures are observed. The value to kit foxes of potential, known, and natal/pupping dens differ and therefore, each den type needs a different level of protection.

**Destruction of any known or natal/pupping kit fox den requires take authorization/permit from the Service.**

Destruction of the den should be accomplished by careful excavation until it is certain that no kit foxes are inside. The den should be fully excavated, filled with dirt and compacted to ensure that kit foxes cannot reenter or use the den during the construction period. If at any point during excavation, a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den as described above should be resumed. Destruction of the den may be completed when in the judgment of the biologist, the animal has escaped, without further disturbance, from the partially destroyed den.

Natal/pupping dens: Natal or pupping dens which are occupied will not be destroyed until the pups and adults have vacated and then only after consultation with the Service. Therefore, project activities at some den sites may have to be postponed.

Known Dens: Known dens occurring within the footprint of the activity must be monitored for three days with tracking medium or an infra-red beam camera to determine the current use. If no kit fox activity is observed during this period, the den should be destroyed immediately to preclude subsequent use.

If kit fox activity is observed at the den during this period, the den should be monitored for at least five consecutive days from the time of the observation to allow any resident animal to move to another den during its normal activity. Use of the den can be discouraged during this period by partially plugging its entrances(s) with soil in such a manner that any resident animal can escape easily. Only when the den is determined to be unoccupied may the den be excavated under the direction of the biologist. If the animal is still present after five or more consecutive days of plugging and monitoring, the den may have to be excavated when, in the judgment of a biologist, it is temporarily vacant, for example during the animal's normal foraging activities.

**The Service encourages hand excavation, but realizes that soil conditions may necessitate the use of excavating equipment. However, extreme caution must be exercised.**

Potential Dens: If a take authorization/permit has been obtained from the Service, den destruction may proceed without monitoring, unless other restrictions were issued with the take authorization/permit. If no take authorization/permit has been issued, then potential dens should be monitored as if they were known dens. If any den was considered to be a potential den, but is later determined during monitoring or destruction to be currently, or previously used by kit fox (e.g., if kit fox sign is found inside), then all construction activities shall cease and the Service shall be notified immediately.

### **CONSTRUCTION AND ON-GOING OPERATIONAL REQUIREMENTS**

Habitat subject to permanent and temporary construction disturbances and other types of ongoing project-related disturbance activities should be minimized by adhering to the following activities. Project designs should limit or cluster permanent project features to the smallest area possible while still permitting achievement of project goals. To minimize temporary disturbances, all project-related vehicle traffic should be restricted to established roads, construction areas, and other designated areas. These areas should also be included in preconstruction surveys and, to the extent possible, should be established in locations disturbed by previous activities to prevent further impacts.

1. Project-related vehicles should observe a daytime speed limit of 20-mph throughout the site in all project areas, except on county roads and State and Federal highways; this is particularly important at night when kit foxes are most active. Night-time construction should be minimized to the extent possible. However if it does occur, then the speed limit should be reduced to 10-mph. Off-road traffic outside of designated project areas should be prohibited.
2. To prevent inadvertent entrapment of kit foxes or other animals during the construction phase of a project, all excavated, steep-walled holes or trenches more than 2-feet deep should be covered at the close of each working day by plywood or similar materials. If the trenches cannot be closed, one or more escape ramps constructed of earthen-fill or wooden planks shall be installed. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the Service and the California Department of Fish and Game (CDFG) shall be contacted as noted under measure 13 referenced below.
3. Kit foxes are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods should be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is

- discovered inside a pipe, that section of pipe should not be moved until the Service has been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.
4. All food-related trash items such as wrappers, cans, bottles, and food scraps should be disposed of in securely closed containers and removed at least once a week from a construction or project site.
  5. No firearms shall be allowed on the project site.
  6. No pets, such as dogs or cats, should be permitted on the project site to prevent harassment, mortality of kit foxes, or destruction of dens.
  7. Use of rodenticides and herbicides in project areas should be restricted. This is necessary to prevent primary or secondary poisoning of kit foxes and the depletion of prey populations on which they depend. All uses of such compounds should observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other State and Federal legislation, as well as additional project-related restrictions deemed necessary by the Service. If rodent control must be conducted, zinc phosphide should be used because of a proven lower risk to kit fox.
  8. A representative shall be appointed by the project proponent who will be the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped kit fox. The representative will be identified during the employee education program and their name and telephone number shall be provided to the Service.
  9. An employee education program should be conducted for any project that has anticipated impacts to kit fox or other endangered species. The program should consist of a brief presentation by persons knowledgeable in kit fox biology and legislative protection to explain endangered species concerns to contractors, their employees, and military and/or agency personnel involved in the project. The program should include the following: A description of the San Joaquin kit fox and its habitat needs; a report of the occurrence of kit fox in the project area; an explanation of the status of the species and its protection under the Endangered Species Act; and a list of measures being taken to reduce impacts to the species during project construction and implementation. A fact sheet conveying this information should be prepared for distribution to the previously referenced people and anyone else who may enter the project site.
  10. Upon completion of the project, all areas subject to temporary ground disturbances, including storage and staging areas, temporary roads, pipeline corridors, etc. should be

re-contoured if necessary, and revegetated to promote restoration of the area to pre-project conditions. An area subject to "temporary" disturbance means any area that is disturbed during the project, but after project completion will not be subject to further disturbance and has the potential to be revegetated. Appropriate methods and plant species used to revegetate such areas should be determined on a site-specific basis in consultation with the Service, California Department of Fish and Game (CDFG), and revegetation experts.

11. In the case of trapped animals, escape ramps or structures should be installed immediately to allow the animal(s) to escape, or the Service should be contacted for guidance.
12. Any contractor, employee, or military or agency personnel who are responsible for inadvertently killing or injuring a San Joaquin kit fox shall immediately report the incident to their representative. This representative shall contact the CDFG immediately in the case of a dead, injured or entrapped kit fox. The CDFG contact for immediate assistance is State Dispatch at (916)445-0045. They will contact the local warden or Mr. Paul Hoffman, the wildlife biologist, at (530)934-9309. The Service should be contacted at the numbers below.
13. The Sacramento Fish and Wildlife Office and CDFG shall be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox during project related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The Service contact is the Chief of the Division of Endangered Species, at the addresses and telephone numbers below. The CDFG contact is Mr. Paul Hoffman at 1701 Nimbus Road, Suite A, Rancho Cordova, California 95670, (530) 934-9309.
14. New sightings of kit fox shall be reported to the California Natural Diversity Database (CNDDDB). A copy of the reporting form and a topographic map clearly marked with the location of where the kit fox was observed should also be provided to the Service at the address below.

Any project-related information required by the Service or questions concerning the above conditions or their implementation may be directed in writing to the U.S. Fish and Wildlife Service at:

Endangered Species Division  
2800 Cottage Way, Suite W2605  
Sacramento, California 95825-1846  
(916) 414-6620 or (916) 414-6600

**EXHIBIT "A" - DEFINITIONS**

"Take" - Section 9 of the Endangered Species Act of 1973, as amended (Act) prohibits the "take" of any federally listed endangered species by any person (an individual, corporation, partnership, trust, association, etc.) subject to the jurisdiction of the United States. As defined in the Act, take means ". . . to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct". Thus, not only is a listed animal protected from activities such as hunting, but also from actions that damage or destroy its habitat.

"Dens" - San Joaquin kit fox dens may be located in areas of low, moderate, or steep topography. Den characteristics are listed below, however, the specific characteristics of individual dens may vary and occupied dens may lack some or all of these features. Therefore, caution must be exercised in determining the status of any den. Typical dens may include the following: (1) one or more entrances that are approximately 5 to 8 inches in diameter; (2) dirt berms adjacent to the entrances; (3) kit fox tracks, scat, or prey remains in the vicinity of the den; (4) matted vegetation adjacent to the den entrances; and (5) manmade features such as culverts, pipes, and canal banks.

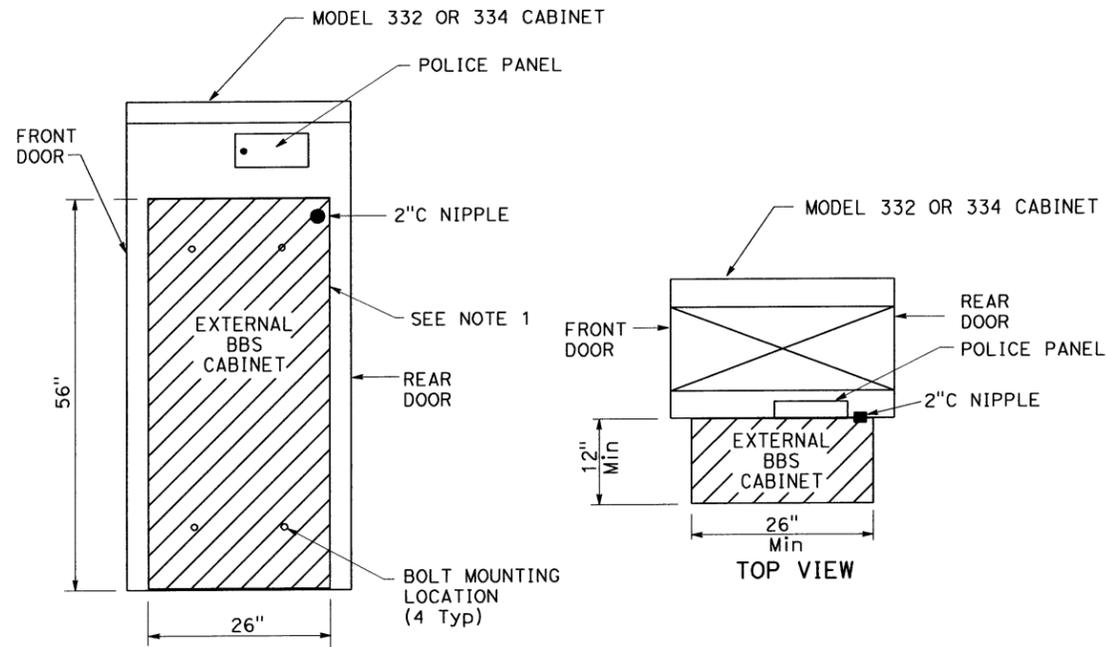
"Known den" - Any existing natural den or manmade structure that is used or has been used at any time in the past by a San Joaquin kit fox. Evidence of use may include historical records, past or current radiotelemetry or spotlighting data, kit fox sign such as tracks, scat, and/or prey remains, or other reasonable proof that a given den is being or has been used by a kit fox. The Service discourages use of the terms "active" and "inactive" when referring to any kit fox den because a great percentage of occupied dens show no evidence of use, and because kit foxes change dens often, with the result that the status of a given den may change frequently and abruptly.

"Potential Den" - Any subterranean hole within the species' range that has entrances of appropriate dimensions for which available evidence is insufficient to conclude that it is being used or has been used by a kit fox. Potential dens shall include the following: (1) any suitable subterranean hole; or (2) any den or burrow of another species (e.g., coyote, badger, red fox, or ground squirrel) that otherwise has appropriate characteristics for kit fox use.

"Natal or Popping Den" - Any den used by kit foxes to whelp and/or rear their pups. Natal/popping dens may be larger with more numerous entrances than dens occupied exclusively by adults. These dens typically have more kit fox tracks, scat, and prey remains in the vicinity of the den, and may have a broader apron of matted dirt and/or vegetation at one or more entrances. A natal den, defined as a den in which kit fox pups are actually whelped but not necessarily reared, is a more restrictive version of the popping den. In practice, however, it is difficult to distinguish between the two, therefore, for purposes of this definition either term applies.

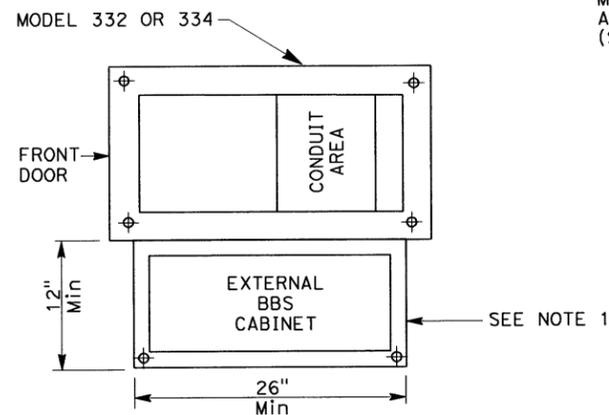
"Atypical Den" - Any manmade structure which has been or is being occupied by a San Joaquin kit fox. Atypical dens may include pipes, culverts, and diggings beneath concrete slabs and buildings.

Dist	COUNTY	LOCATION CODE	POST MILES TOTAL PROJECT	SHEET TOTAL No. SHEETS
Theresa Gabriel		12-20-07		
REGISTERED CIVIL ENGINEER		DATE		
PLANS APPROVAL DATE				
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>				



SIDE VIEW

**EXTERNAL BBS CABINET MOUNTED TO THE MODEL 332 OR 334 CABINET**

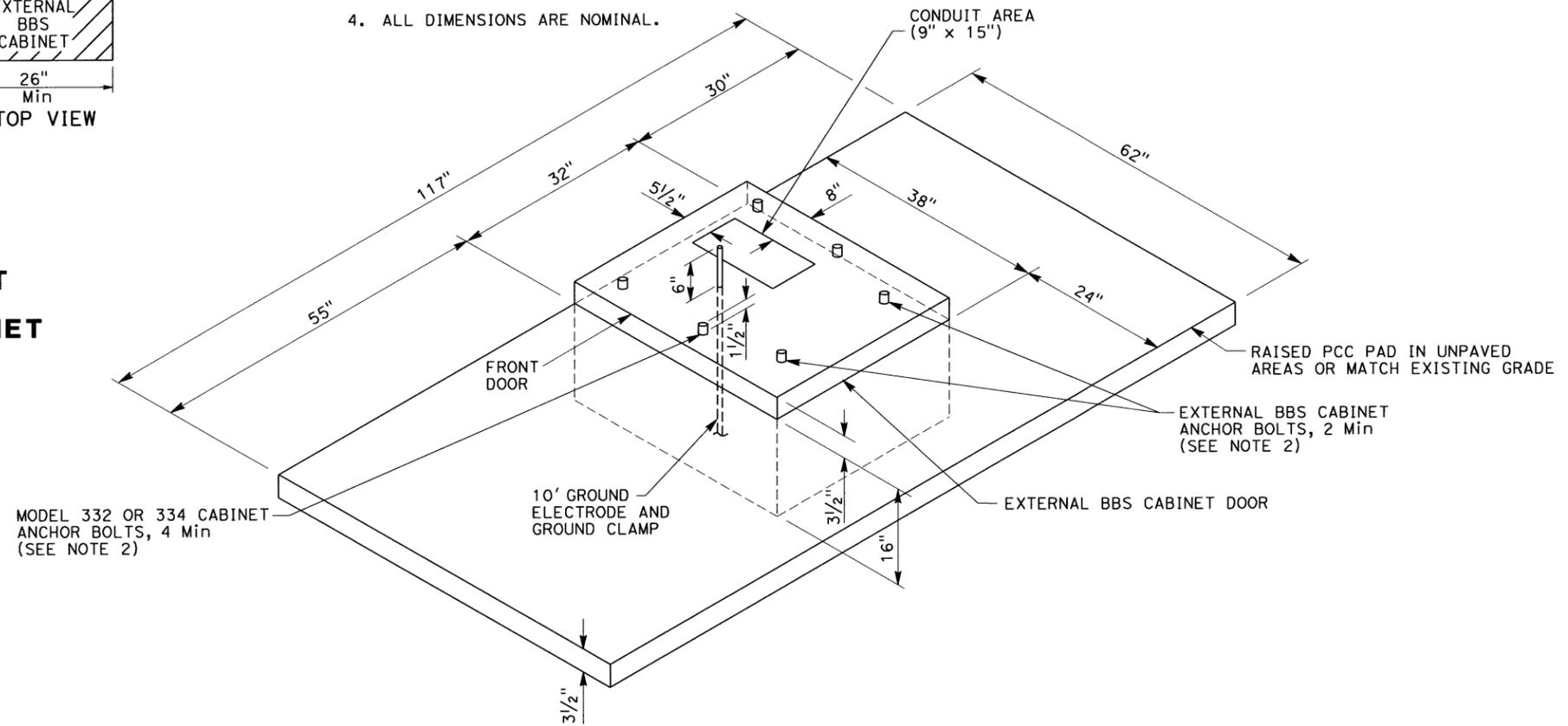


**BASE PLAN FOR BBS MOUNTED TO THE MODEL 332 OR 334 CABINET**

(FOR DIMENSIONS AND DETAILS NOT SHOWN, SEE SHEET A6-1 TO A6-4, CABINET HOUSING DETAILS OF THE TRANSPORTATION ELECTRICAL EQUIPMENT SPECIFICATION (TEES))

**NOTE: (THIS SHEET ONLY)**

1. THE EXTERNAL BBS CABINET SHALL BE MOUNTED TO THE MODEL 332 OR 334 CABINET WITH FOUR 18-8 STAINLESS STEEL HEX HEAD, FULLY-THREADED, 3/8"-16 X 1" BOLTS; TWO WASHERS PER BOLT, DESIGNED FOR 3/8" BOLTS AND ARE 18-8 STAINLESS STEEL, 1" OUTSIDE DIAMETER, ROUND, AND FLAT; AND ONE K-LOCK NUT PER BOLT THAT IS 18-8 STAINLESS STEEL AND A HEX-NUT. THE ENGINEER WILL HAVE TO APPROVE THE BOLT MOUNTING LOCATION PRIOR TO INSTALLATION.
2. THE ANCHOR BOLTS SHALL BE 3/4" Dia X 15" WITH A 2"-90° BEND. THE CABINET MANUFACTURER'S SPECIFICATION SHALL DETERMINE THE LOCATION OF THE ANCHOR BOLTS IN THE FOUNDATION. THE ENGINEER WILL HAVE TO APPROVE THE ANCHOR BOLTS AND ITS LOCATION IN THE FOUNDATION PRIOR TO CONSTRUCTION.
3. THE CONTRACTOR SHALL VERIFY THE DIMENSIONS OF THE BBS CABINET PRIOR TO CONSTRUCTING THE FOUNDATION OF THE MODIFIED PORTION OF THE Std MODEL 332 AND 334 CABINET FOUNDATION. THE ENGINEER WILL HAVE TO APPROVE ANY NECESSARY DEVIATIONS PRIOR TO CONSTRUCTION.
4. ALL DIMENSIONS ARE NOMINAL.



**MODIFIED MODEL 332 AND 334 CABINET FOUNDATION DETAIL FOR BATTERY BACKUP SYSTEM (BBS)**

(FOR DIMENSIONS AND DETAILS NOT SHOWN AND ADDITIONAL NOTES, SEE SHEET ES-3C OF THE STANDARD PLANS FOR MODEL 332 AND 334 CABINETS)

**ELECTRICAL SYSTEMS (BBS FOUNDATION DETAILS)**

NO SCALE

THIS PLAN IS ACCURATE FOR ELECTRICAL WORK ONLY.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

REVISED BY  
DATE

CALCULATED-DESIGNED BY  
CHECKED BY

FUNCTIONAL SUPERVISOR

DEPARTMENT OF TRANSPORTATION

x

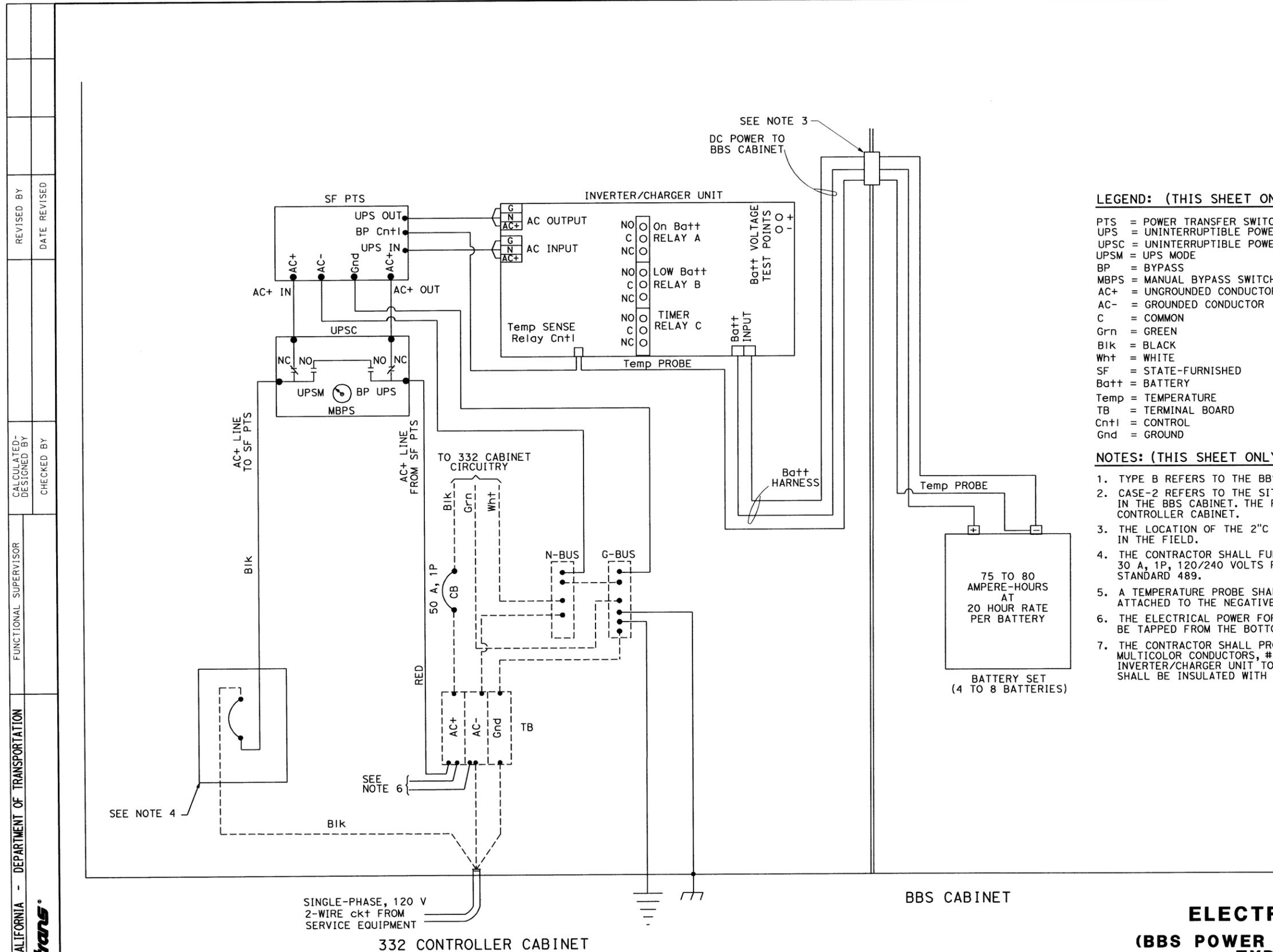
DIST	COUNTY	LOCATION CODE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

Theresa Gabriel 12-20-07  
 REGISTERED CIVIL ENGINEER DATE

Theresa A. Gabriel  
 No. E15129  
 Exp. 6-30-10  
 ELECT  
 STATE OF CALIFORNIA

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



**LEGEND: (THIS SHEET ONLY)**

- PTS = POWER TRANSFER SWITCH
- UPS = UNINTERRUPTIBLE POWER SUPPLY
- UPSC = UNINTERRUPTIBLE POWER SUPPLY CONTROLLER
- UPSM = UPS MODE
- BP = BYPASS
- MBPS = MANUAL BYPASS SWITCH
- AC+ = UNGROUNDED CONDUCTOR
- AC- = GROUNDED CONDUCTOR
- C = COMMON
- Grn = GREEN
- Blk = BLACK
- Wht = WHITE
- SF = STATE-FURNISHED
- Batt = BATTERY
- Temp = TEMPERATURE
- TB = TERMINAL BOARD
- Cntl = CONTROL
- Gnd = GROUND

**NOTES: (THIS SHEET ONLY)**

1. TYPE B REFERS TO THE BBS EQUIPMENT FROM MANUFACTURER B.
2. CASE-2 REFERS TO THE SITUATION WHEN ONLY THE BATTERIES ARE INSTALLED IN THE BBS CABINET. THE REMAINING EQUIPMENT IS PLACED IN THE 332 CONTROLLER CABINET.
3. THE LOCATION OF THE 2" C NIPPLE WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.
4. THE CONTRACTOR SHALL FURNISH AND INSTALL A NEMA-1 ENCLOSURE WITH 30 A, 1P, 120/240 VOLTS RATED CIRCUIT BREAKER MANUFACTURED PER UL STANDARD 489.
5. A TEMPERATURE PROBE SHALL BE ATTACHED TO THE BATTERY BY TAPE OR ATTACHED TO THE NEGATIVE TERMINAL OF THE BATTERY.
6. THE ELECTRICAL POWER FOR THE COOLING FAN FOR THE BBS CABINET SHALL BE TAPPED FROM THE BOTTOM OF THE TB IN THE 332 CABINET.
7. THE CONTRACTOR SHALL PROVIDE A 9-WIRE WIRING HARNESS OR BUNDLED 9 MULTICOLOR CONDUCTORS, #18 AWG WIRES FROM THE RELAY ON THE INVERTER/CHARGER UNIT TO THE CONTROLLER. THE ENDS OF THE CONDUCTORS SHALL BE INSULATED WITH TAPE AND A SIX-FOOT COIL ON EACH END.

**ELECTRICAL SYSTEM**  
**(BBS POWER CONNECTION DIAGRAM, TYPE B, CASE-2)**

DIST	COUNTY	LOCATION CODE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

Theresa Gabriel  
 REGISTERED CIVIL ENGINEER DATE 12-20-07  
 No. E15129  
 Exp. 6-30-10  
 ELECT  
 STATE OF CALIFORNIA

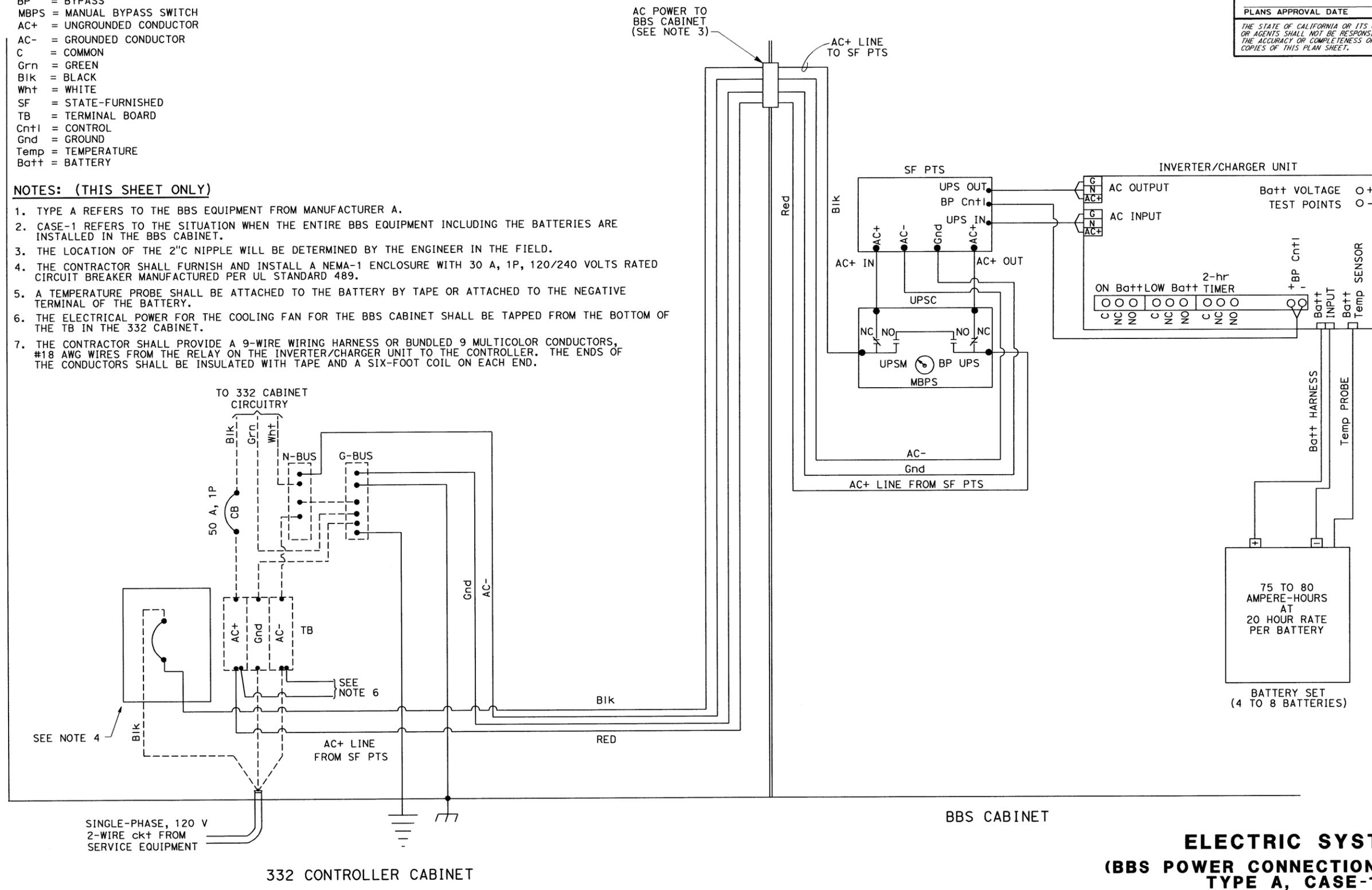
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- SF = STATE-FURNISHED
- TB = TERMINAL BOARD
- Cntl = CONTROL
- Gnd = GROUND
- Temp = TEMPERATURE
- Batt = BATTERY

**NOTES: (THIS SHEET ONLY)**

1. TYPE A REFERS TO THE BBS EQUIPMENT FROM MANUFACTURER A.
2. CASE-1 REFERS TO THE SITUATION WHEN THE ENTIRE BBS EQUIPMENT INCLUDING THE BATTERIES ARE INSTALLED IN THE BBS CABINET.
3. THE LOCATION OF THE 2" C NIPPLE WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.
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**ELECTRIC SYSTEM  
(BBS POWER CONNECTION DIAGRAM, TYPE A, CASE-1)**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
Caltrans

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES

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DGN FILE => BBS 1250FSM.dgn

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EA 000000

DATE PLOTTED => 13-MAR-2009  
TIME PLOTTED => 09:06  
LAST REVISION  
3-11-09

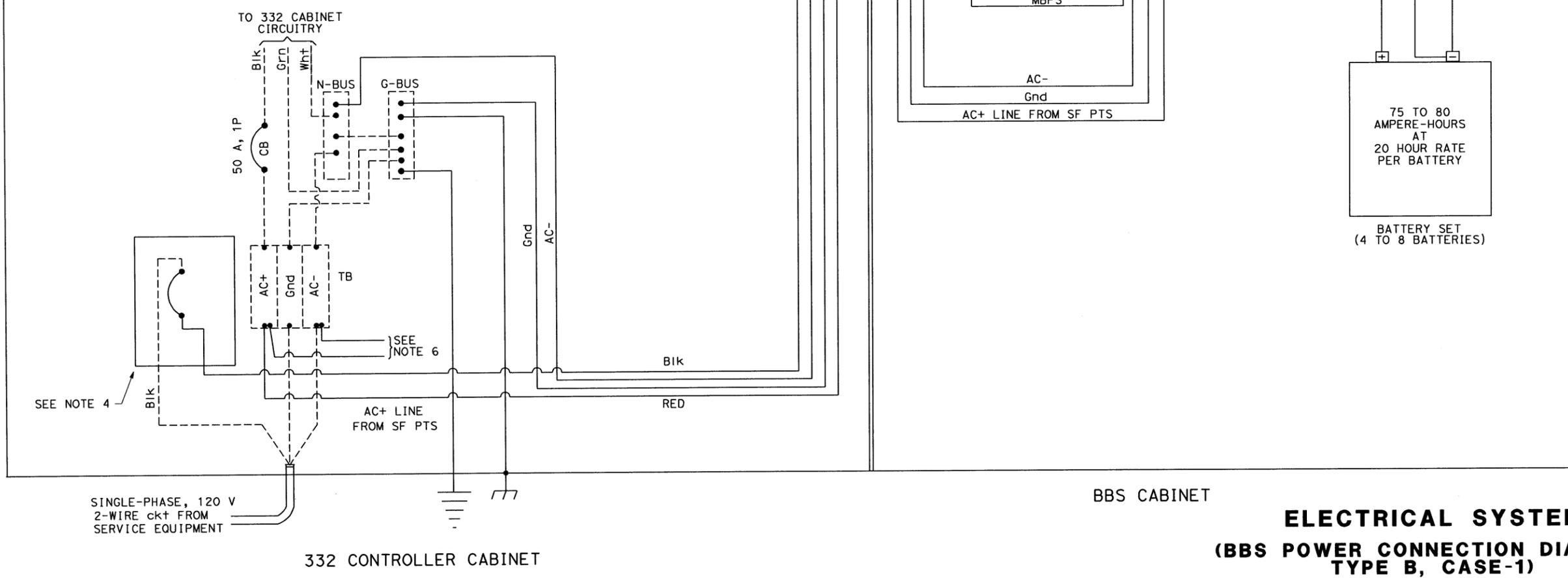
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<i>Theresa Gabriel</i> REGISTERED CIVIL ENGINEER			12-20-07 DATE	REGISTERED PROFESSIONAL ENGINEER Theresa A. Gabriel No. E15129 Exp 6-30-10 ELECT STATE OF CALIFORNIA	
PLANS APPROVAL DATE					
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					

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**NOTES: (THIS SHEET ONLY)**

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3. THE LOCATION OF THE 2" C NIPPLE WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.
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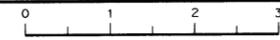


**ELECTRICAL SYSTEM**  
**(BBS POWER CONNECTION DIAGRAM, TYPE B, CASE-1)**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
*Caltrans*

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES



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 DGN FILE => BBS DUFSM.dgn

CU 0000

EA 00000

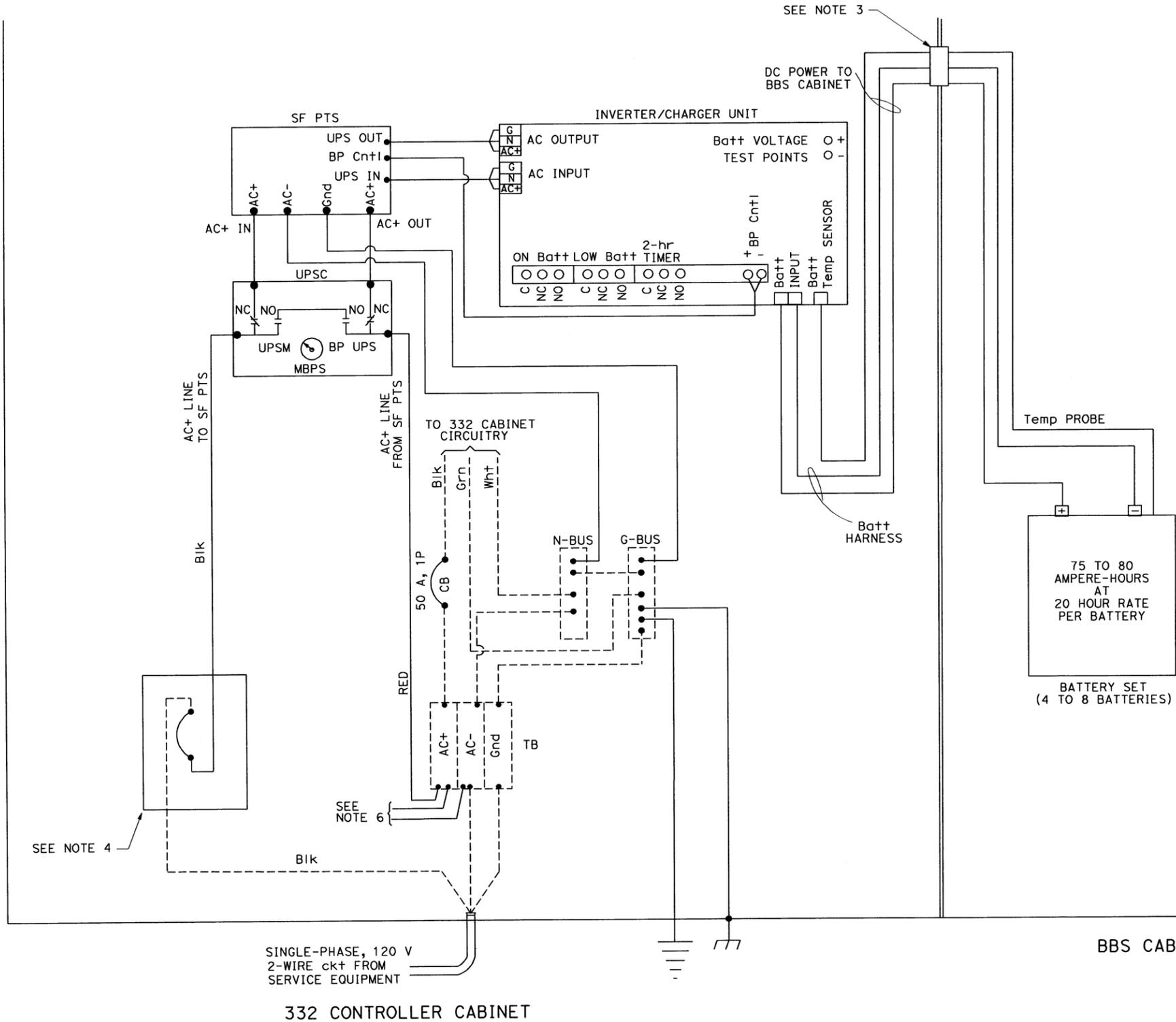
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DIST	COUNTY	LOCATION CODE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

Theresa Gabriel  
 REGISTERED CIVIL ENGINEER DATE 12-20-07  
 No. E15129  
 Exp. 6-30-10  
 ELECT  
 STATE OF CALIFORNIA

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 Caltrans  
 FUNCTIONAL SUPERVISOR  
 CALCULATED/DESIGNED BY  
 CHECKED BY  
 REVISOR BY  
 DATE REVISOR



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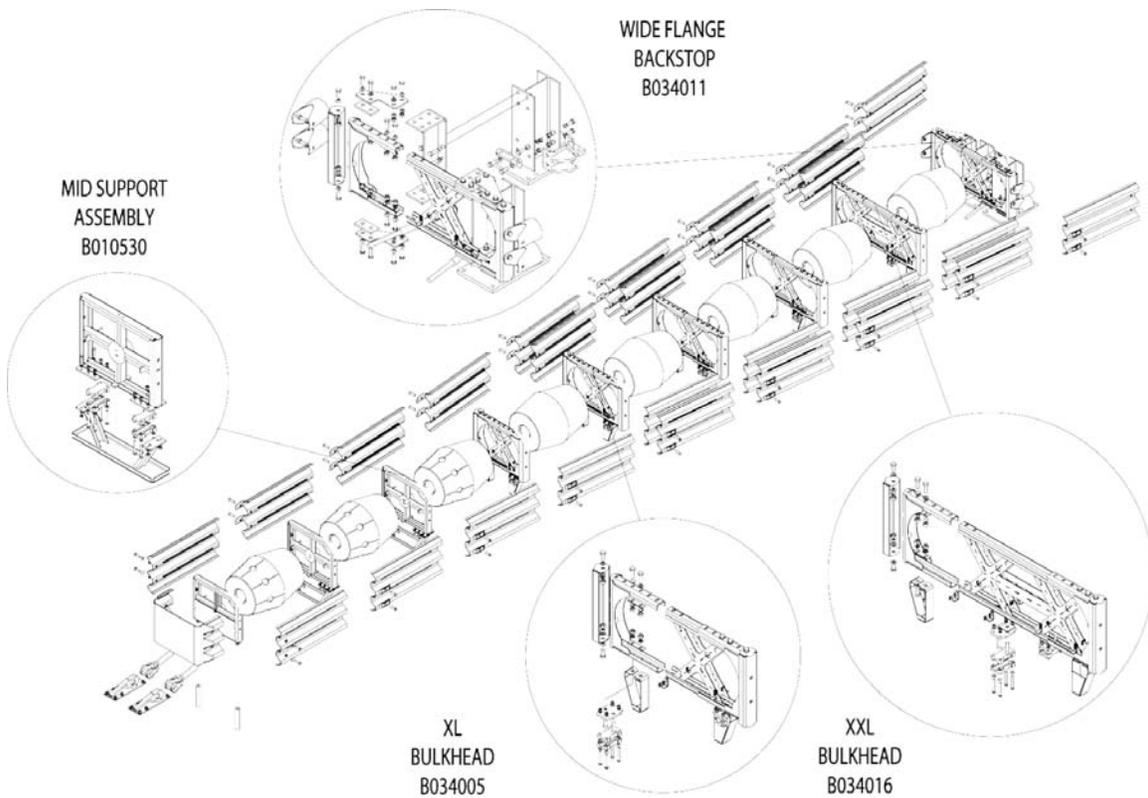
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**ELECTRICAL SYSTEMS**  
**(BBS POWER CONNECTION DIAGRAM, TYPE A, CASE-2)**  
 NO SCALE

# Installation and Assembly Manual

## UNIVERSAL TAU-II<sup>®</sup> Crash Cushion

Step By Step Instructions For Parallel & Tapered Systems

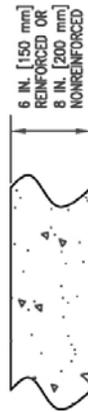


*“Advancing Safety Through Innovation”*

# FOUNDATION SPECIFICATIONS:

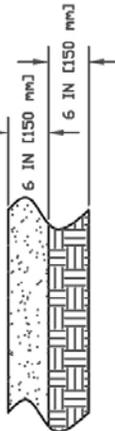
THE TAU-II CRASH CUSHION SYSTEM HAS BEEN DESIGNED TO ATTACH TO CONCRETE OR ASPHALT FOUNDATIONS. USE THE ANCHORAGE SPECIFIED BELOW DEPENDING ON THE FOUNDATION AT THE JOB SITE. REFERENCE UNIVERSAL TAU-II FOUNDATION DRAWINGS FOR FURTHER DETAIL.

## 1.) CONCRETE PAD



FOUNDATION: MINIMUM 6 IN. (150 mm) REINFORCED PCC PAD OR 8 IN. (200 mm) NONREINFORCED PCC PAD  
 ANCHORAGE: 3/4 IN. (20 mm) X 6 1/4 IN. (210 mm) GALVANIZED ANCHOR WITH 6 IN. (150 mm) EMBEDMENT

## 2.) ASPHALT OVER SUBBASE



FOUNDATION: MINIMUM 6 IN. (150 mm) AC OVER 6 IN. (150 mm) COMPACTED DGA SUBBASE  
 ANCHORAGE: 3/4 IN. (20 mm) X 18 IN. (460 mm) GALVANIZED ANCHORS WITH 16 IN. (410 mm) EMBEDMENT  
 ASPHALT ANCHORING KIT REQUIRED

## 3.) ASPHALT ONLY



FOUNDATION: MINIMUM 8 IN. (200 mm) AC  
 ANCHORAGE: 3/4 IN. (20 mm) X 18 IN. (460 mm) GALVANIZED ANCHORS WITH 16 IN. (410 mm) EMBEDMENT  
 ASPHALT ANCHORING KIT REQUIRED

## 4.) ASPHALT OVER P.C. CONCRETE



FOUNDATION: AC OVER PCC.  
 ANCHORAGE: 3/4 IN. (20 mm) GALVANIZED ANCHORS WITH MINIMUM 6 IN. (150 mm) EMBEDMENT IN PCC - ASPHALT ANCHORING KIT NOT REQUIRED  
 OR  
 IF 6 IN. (150 mm) EMBEDMENT IN PCC IS NOT POSSIBLE USE 3/4 IN. (20 mm) X 18 IN. (460 mm) GALVANIZED ANCHORS WITH 16 IN. (410 mm) EMBEDMENT - ASPHALT ANCHORING KIT REQUIRED

## MATERIAL SPECIFICATIONS

### PORTLAND CEMENT CONCRETE (PCC)



STONE AGGREGATE CONCRETE MIX, 4,000 PSI (28 MPa) MINIMUM COMPRESSIVE STRENGTH (SAMPLING PER ASTM C31-84 OR ASTM C42-84A, TESTING PER ASTM C39-84)

### ASPHALTIC CONCRETE (AC)



AR-4000 A.C. (PER ASTM D3381 '83), 75% MAXIMUM, MEDIUM (TYPE A OR B) AGGREGATE

SIEVE SIZE	% PASSING
1"	100
3/4"	95-100
3/8"	65-80
No. 4	49-54
No. 8	38-40
No. 30	18-21
No. 200	3-8

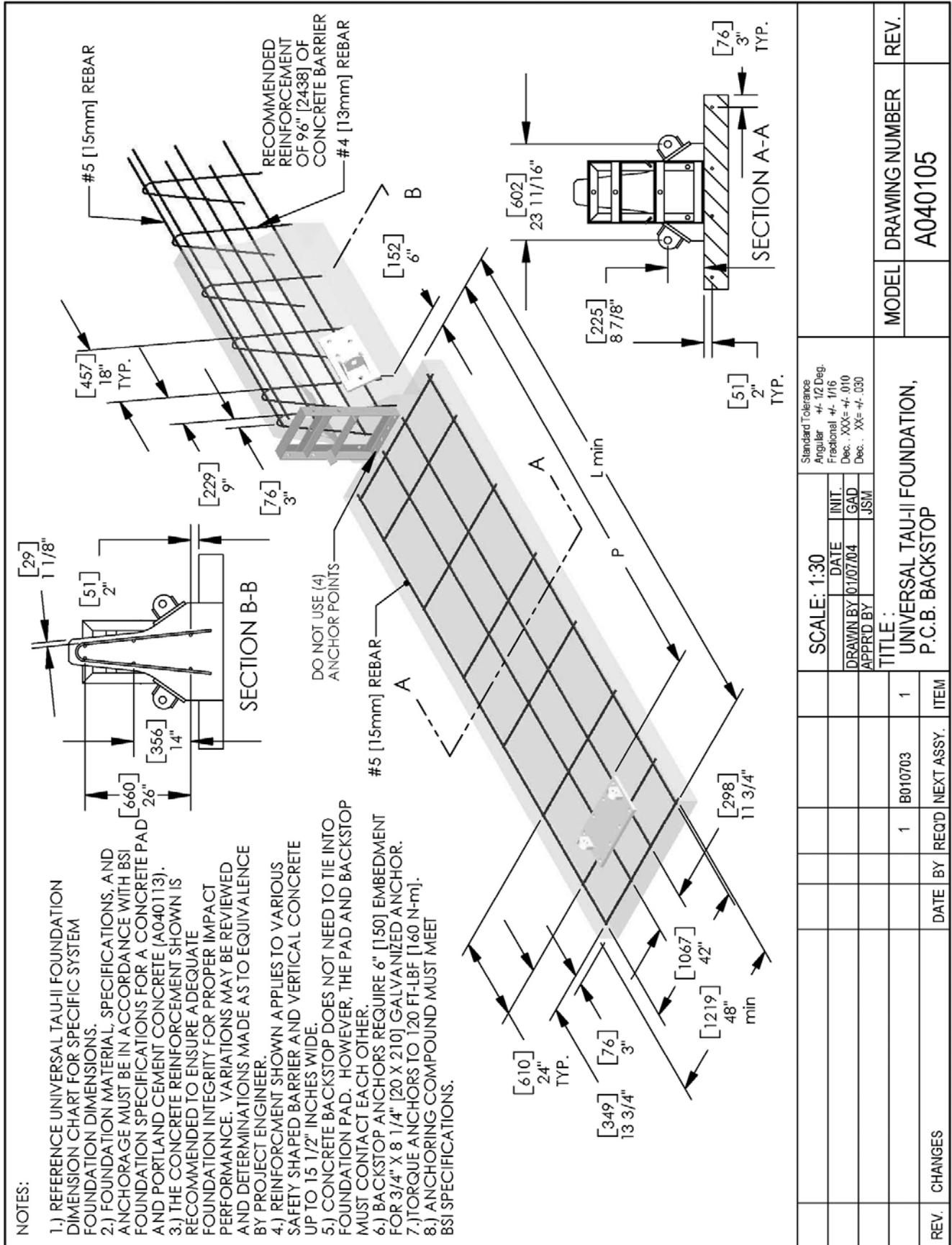
### COMPACTED SUBBASE (DGA)

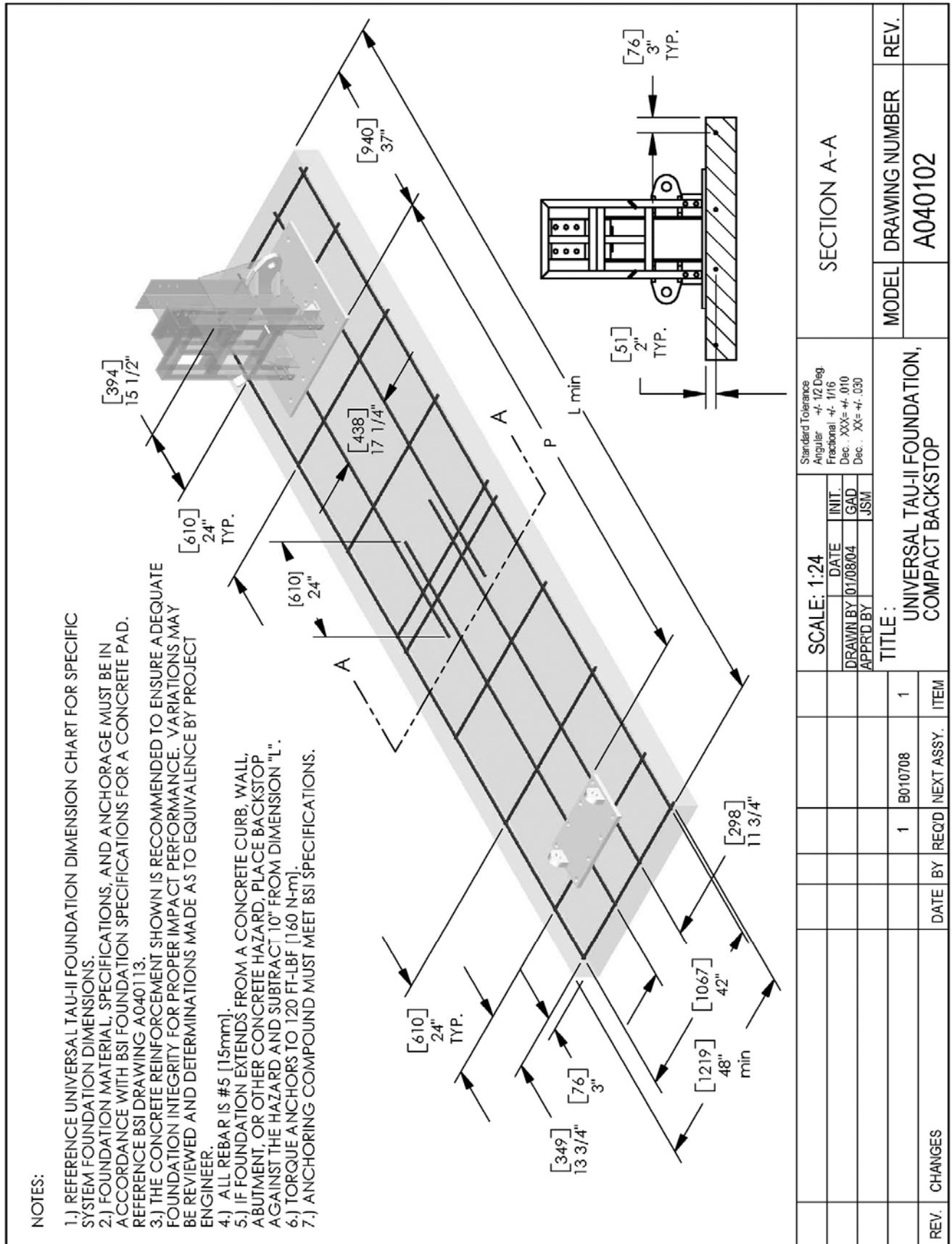


6 IN. (150 mm) MINIMUM DEPTH, 95% COMPACTION, CLASS 2 AGGREGATE

SIEVE SIZE	% PASSING
3"	100
2 1/2"	90-100
No. 4	40-90
No. 200	0-25

SCALE: FULL	DATE: 01/09/04	INT. GAD	Standard Tolerance Angular ± 1/2
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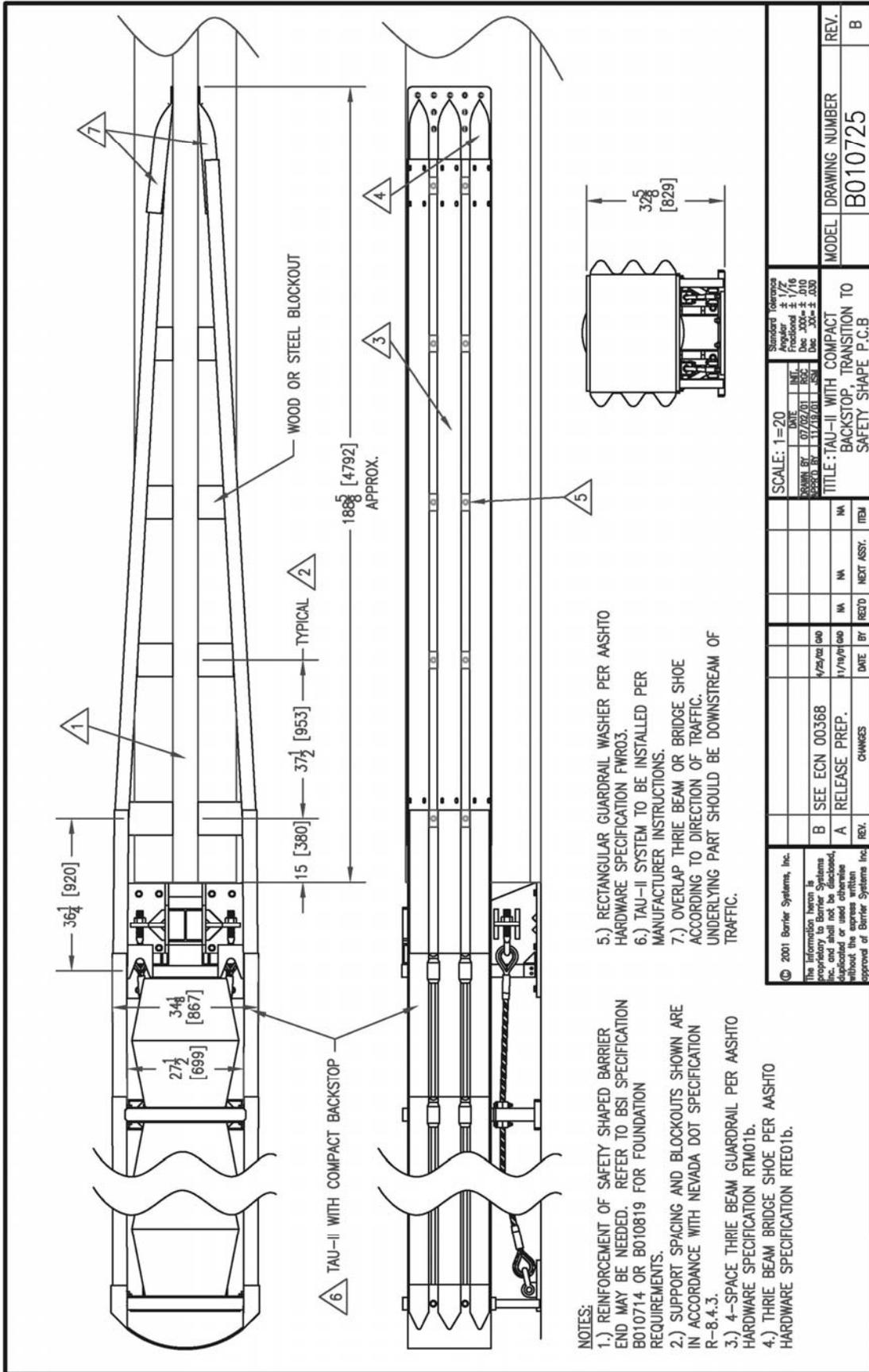






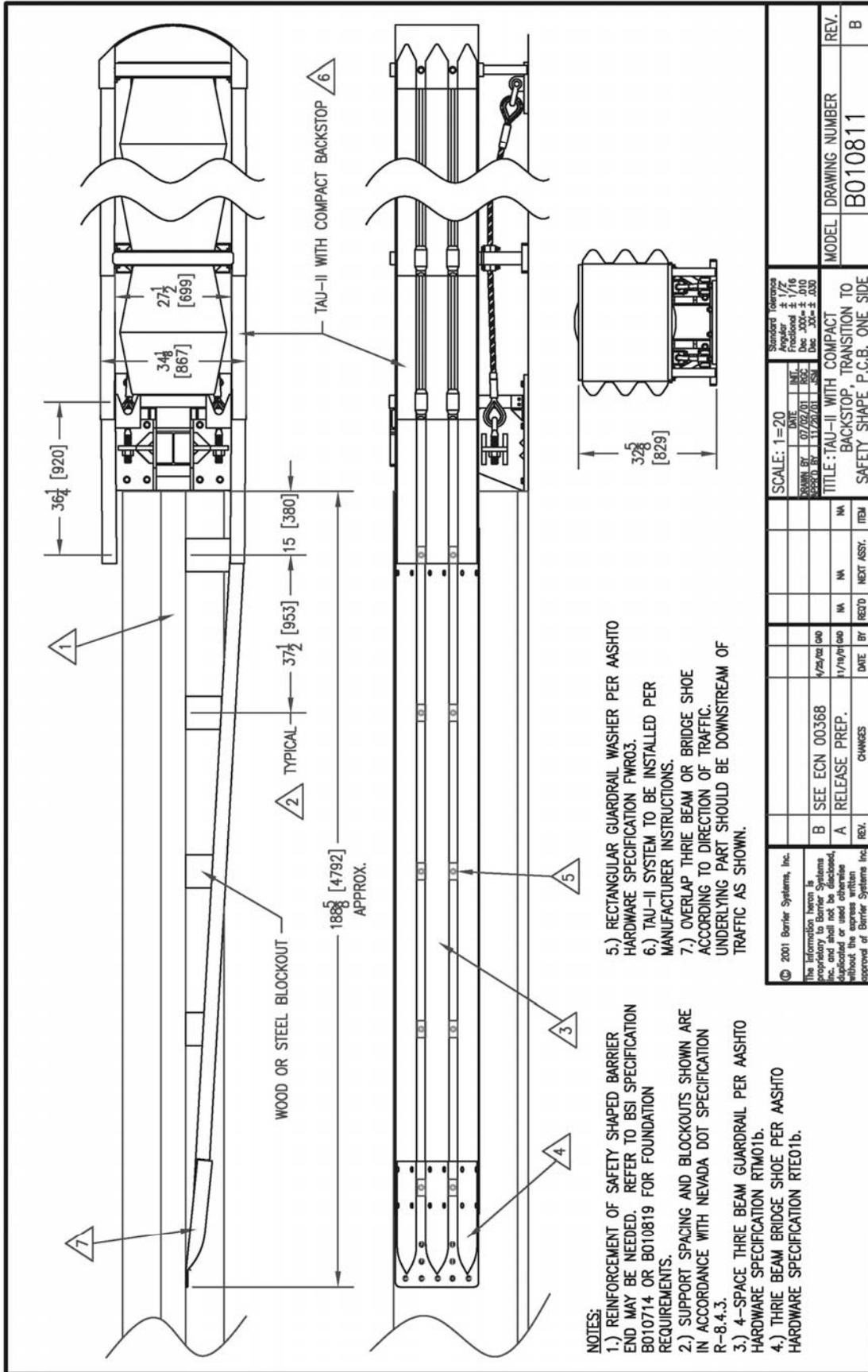


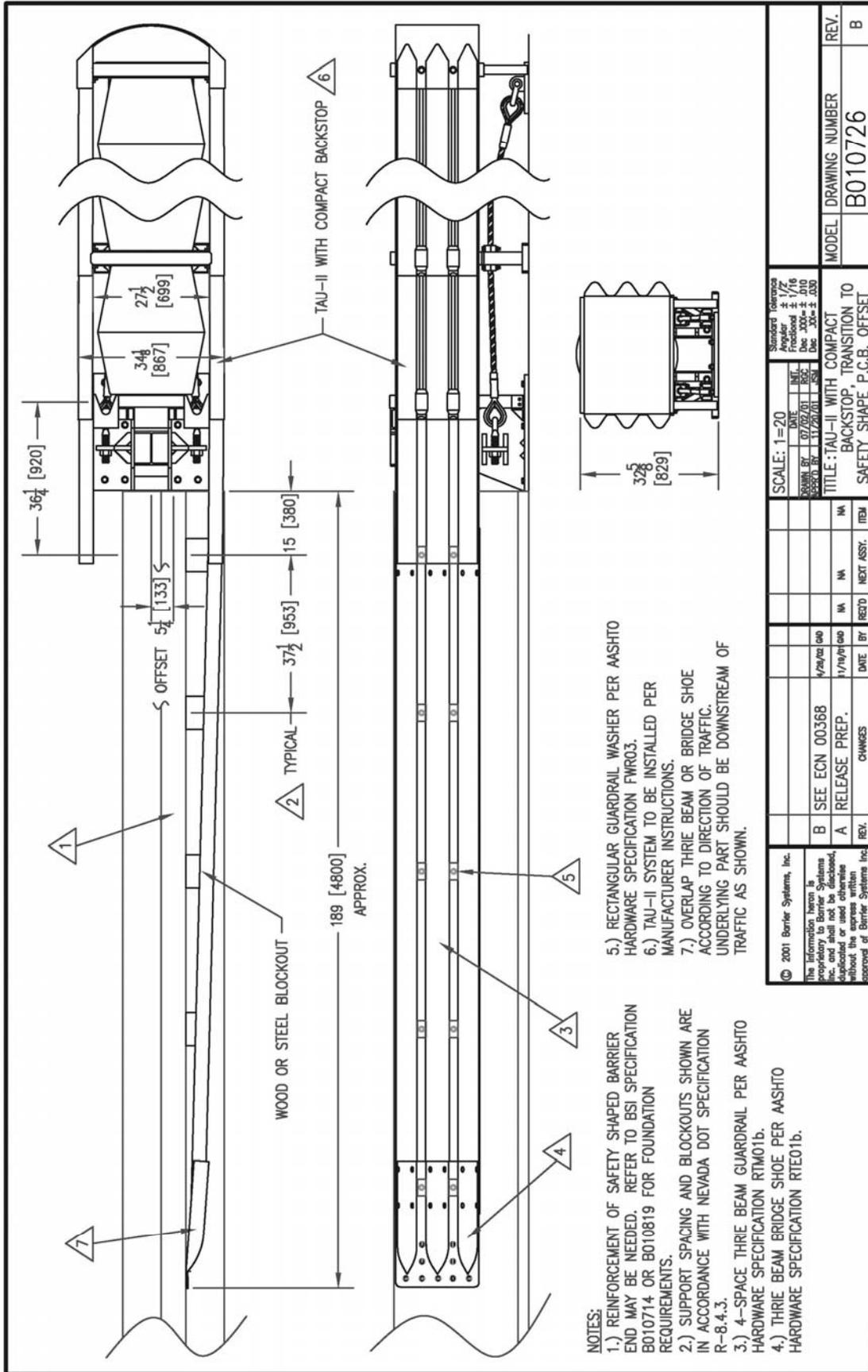




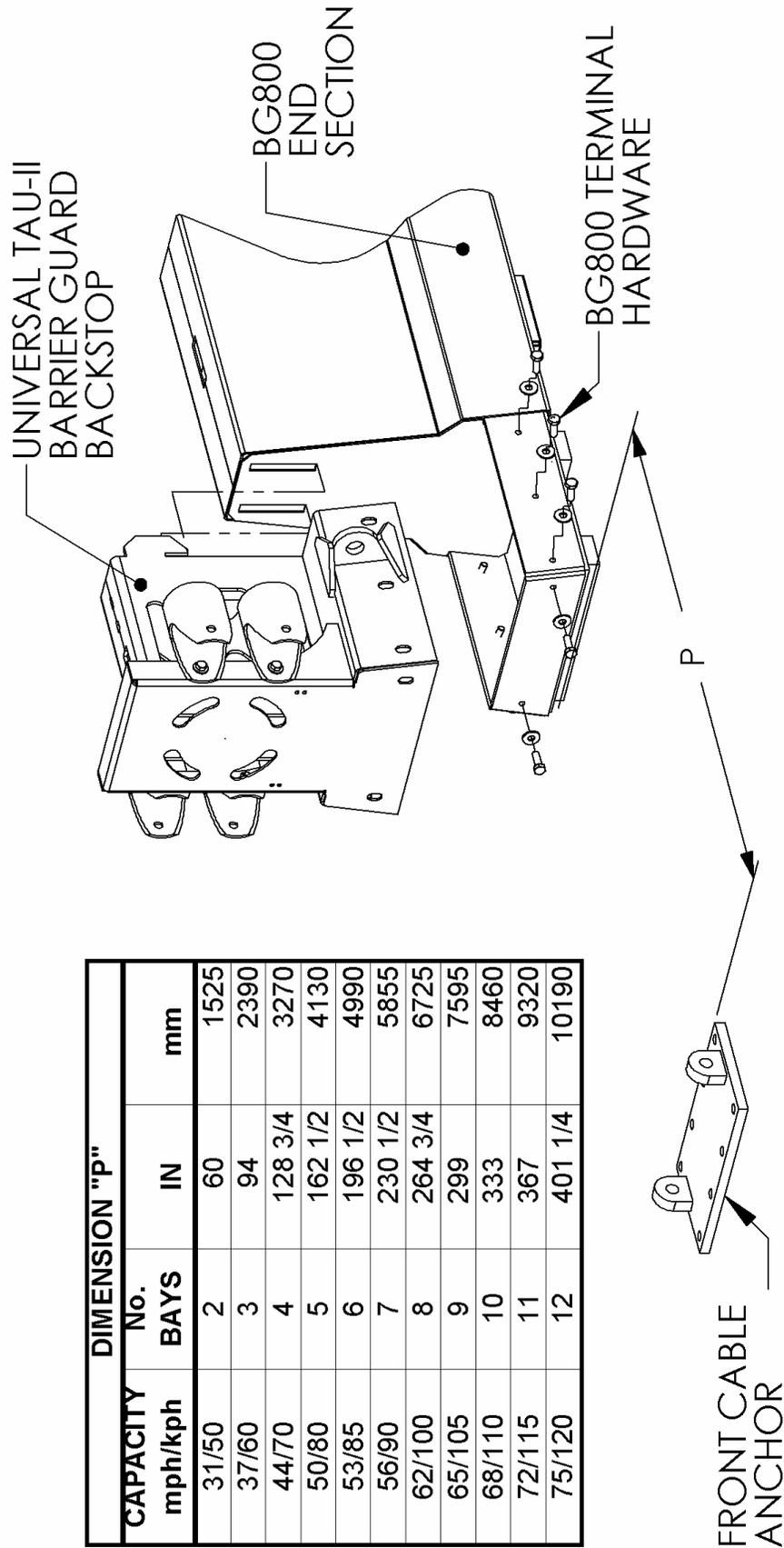
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TITLE: TAU-II WITH COMPACT BACKSTOP, TRANSITION TO SAFETY SHAPE P.C.B.		DATE: 1/25/00 BY: 1/25/00	DATE: 1/19/00 BY: 1/19/00	CHANGES:	DRAWING NUMBER: B010725
B SEE ECN 00368	A RELEASE PREP.	REW	REW	REW	REV. B

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DIMENSION "P"				
CAPACITY	No.	IN		mm
mph/kph	BAYS			
31/50	2	60		1525
37/60	3	94		2390
44/70	4	128	3/4	3270
50/80	5	162	1/2	4130
53/85	6	196	1/2	4990
56/90	7	230	1/2	5855
62/100	8	264	3/4	6725
65/105	9	299		7595
68/110	10	333		8460
72/115	11	367		9320
75/120	12	401	1/4	10190

# QUADGUARD® II

The New  
Standard  
in Crash  
Cushions

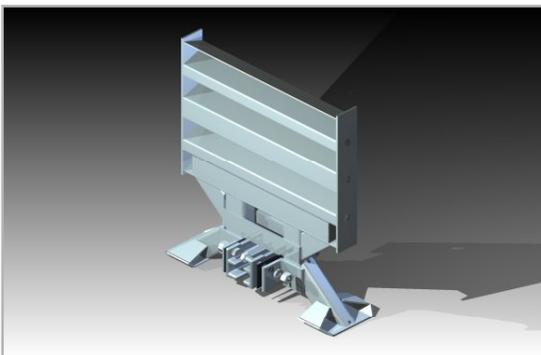
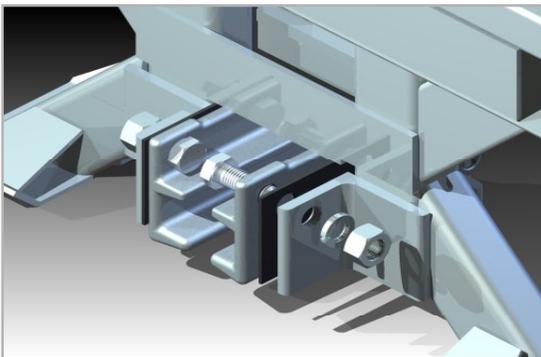


## OVERVIEW

The QuadGuard family has evolved again! Using the existing framework of the QuadGuard, the QuadGuard II provides TL-2 and TL-3 protection using less length. The TL-2 QuadGuard II is 25% shorter than the original QuadGuard measuring less than 3m (10'). The TL-3 model is also nearly a meter, 3 feet, shorter than its predecessor.

The only modifications are the addition of the revolutionary Steel Nose, and the monorail Guide Stabilizers. The remaining components are identical to the existing NCHRP 350 systems that have been installed globally since the mid 1990's.

The QuadGuard II will telescope rearward on head-on impacts by both the light car and the high center-of-gravity pickup truck at speeds up to 100 km/h (62 mph) and safely redirect errant vehicles on impact up to 20 angles into the side of the unit without gating.



## POST IMPACT DEBRIS

The design of the QuadGuard II does an excellent job of minimizing debris affecting other vehicles in the roadway.

## FEATURES AND BENEFITS

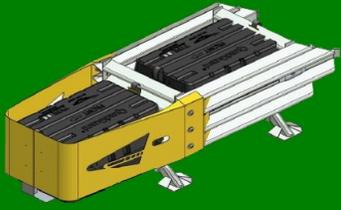
- More is LESS!
- QuadGuard II has up to 25% less footprint reducing installation cost
- Steel Nose provides excellent visibility
- Majority of system is identical to QuadGuard- reduced inventory requirements
- Shorter Systems are less likely to be impacted
- Offers hazard protection from 40 km/h (25mph) to 115 km/h to (70mph)



**ENERGY ABSORPTION  
SYSTEMS, INC.**

SAVING LIVES BY DESIGN®

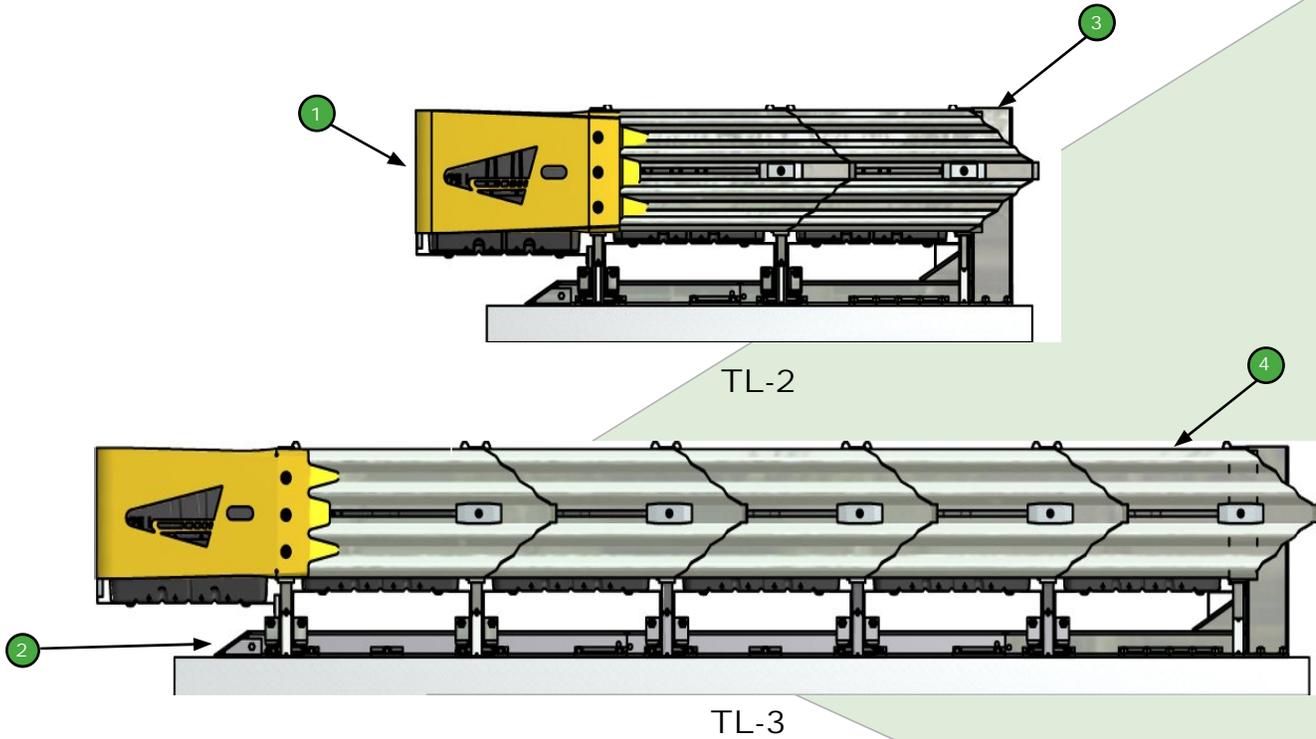
[www.energyabsorption.com](http://www.energyabsorption.com)



## SPECIFICATIONS

Minimum Width at Backup	610 mm	(2')
Maximum Width at Backup	2.3 m	(8')
TL-2 Effective Length	2.6 m	(8'8")
TL-3 Effective Length	5.4 m	(8'8")

- 1 ENGINEERED STEEL NOSE
- 2 MONORAIL
- 3 STEEL BACKUP
- 4 FENDER PANEL



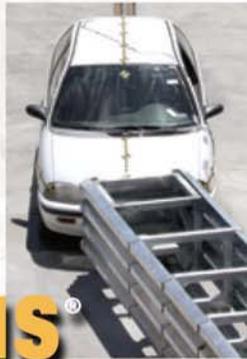
DISTRIBUTED BY:



SCI Products Inc.

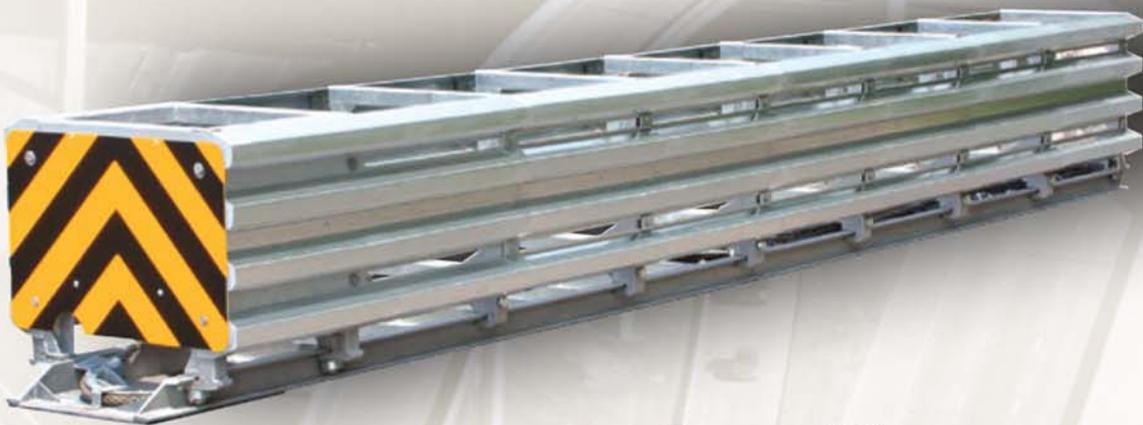
**SCI70GM AND SCI100GM  
DESIGN AND INSTALLATION  
MANUAL**

**The World's Only  
Speed-Dependent  
Crash Attenuator**



**SMART CUSHION INNOVATIONS®**

NCHRP 350 Approved



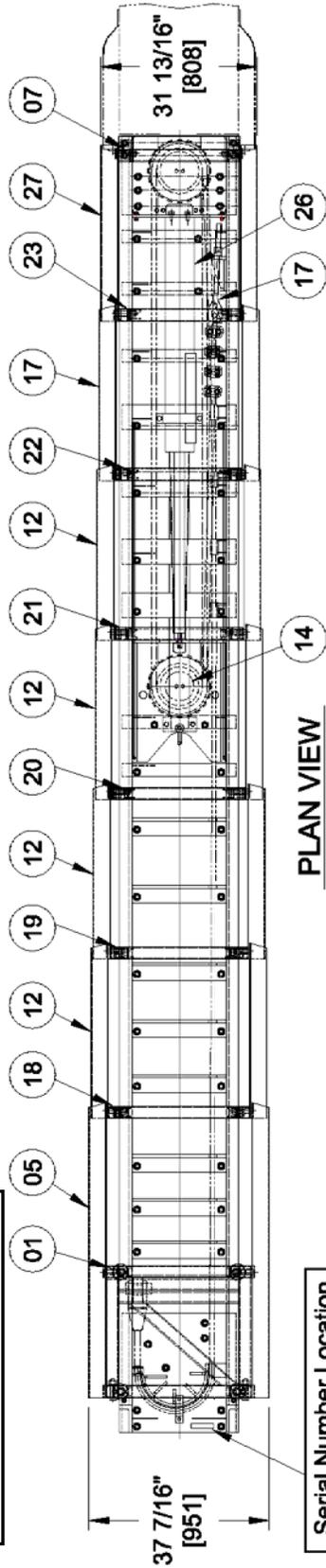
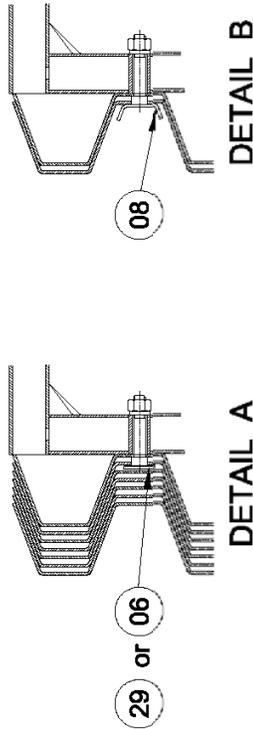
**Corporate Office:  
2500 Production Drive  
St. Charles, IL 60174  
Telephone: 800-327-4417  
[www.workareaprotection.com](http://www.workareaprotection.com)**



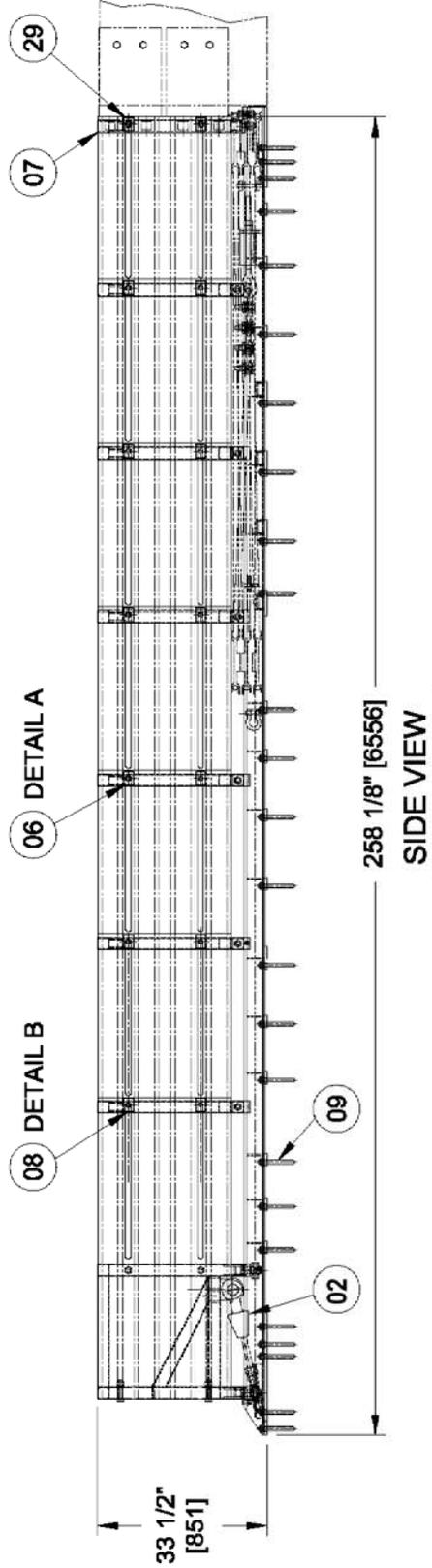
**Work Area Protection**

**APPENDIX D - SMART CUSHION®, TEST LEVEL 3**

PARTS LIST	
01	Front Sled
02	Cable Assembly
05	Sled Panel
07	Terminal Brace
09	Anchor Bolts
12	Side Panels
14	Mobile Sheave Assembly
17	Cable Adjuster Bolt
18-23	Mobile Frames 1-6
26	Cylinder
27	Rear Panel
06, 08, 29	Side Keepers



Serial Number Location

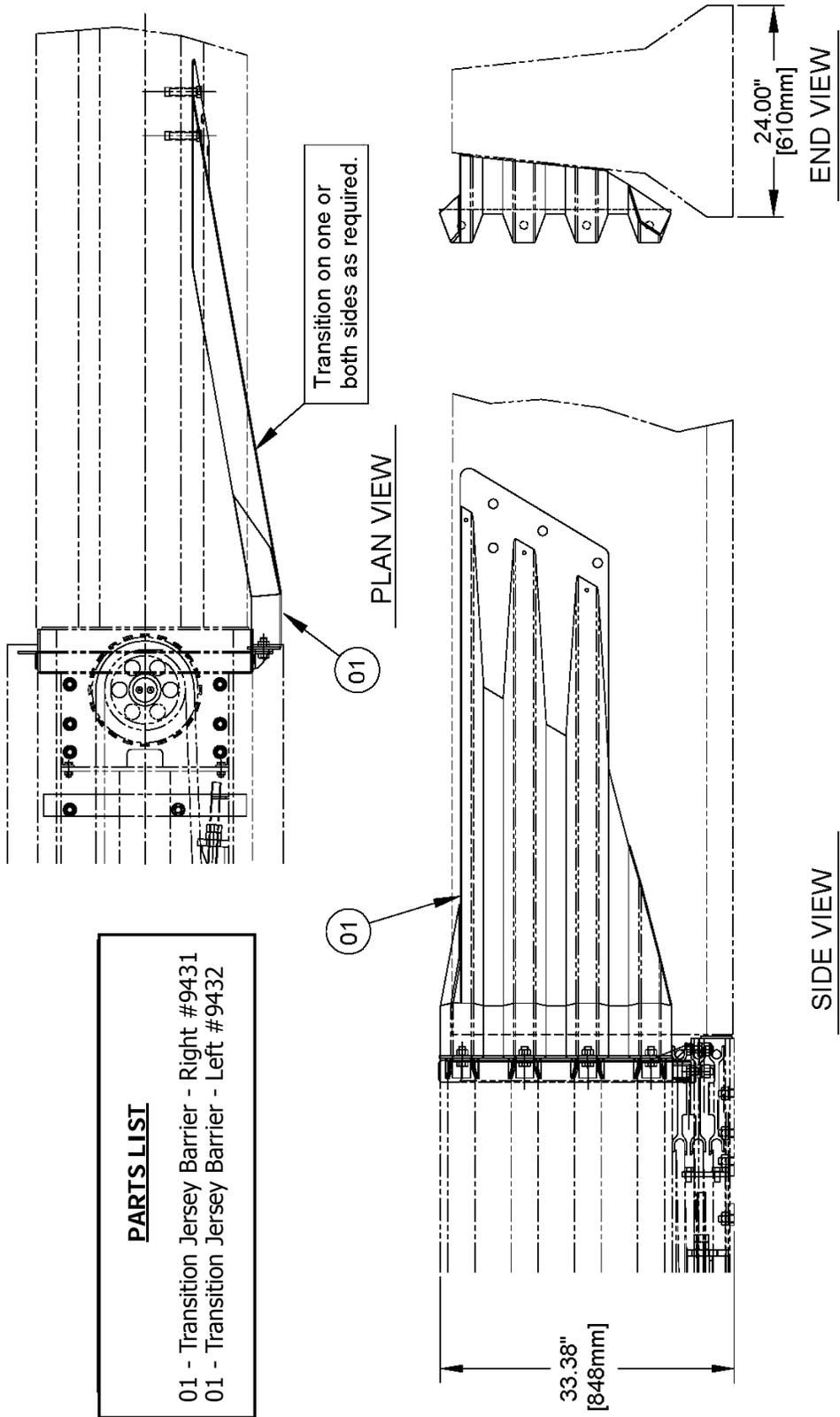




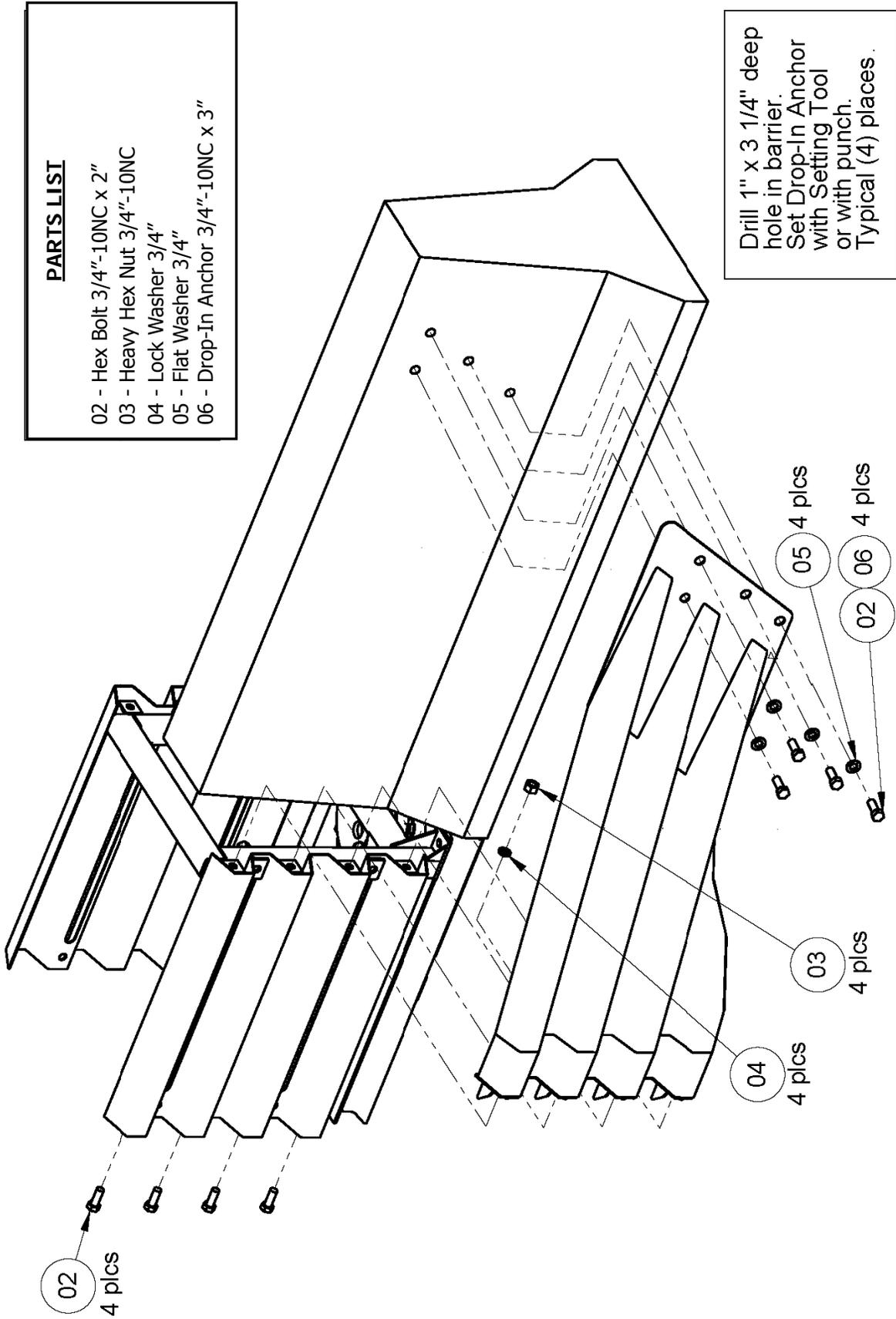
**APPENDIX G - TRANSITION, JERSEY/F SHAPE BARRIER**

**PARTS LIST**

01	- Transition Jersey Barrier - Right	#9431
01	- Transition Jersey Barrier - Left	#9432



APPENDIX G(2) - TRANSITION, JERSEY/F SHAPE BARRIER



**PARTS LIST**

- 02 - Hex Bolt 3/4"-10NC x 2"
- 03 - Heavy Hex Nut 3/4"-10NC
- 04 - Lock Washer 3/4"
- 05 - Flat Washer 3/4"
- 06 - Drop-In Anchor 3/4"-10NC x 3"

Drill 1" x 3 1/4" deep hole in barrier.  
Set Drop-In Anchor with Setting Tool or with punch.  
Typical (4) places.