STANDARDS REGARDING SDG&E® TRANSMISSION CORRIDORS

Revised September 2020

STANDARDS REGARDING SDG&E TRANSMISSION CORRIDORS

APPENDIX

STANDARDS REGARDING SDG&E TRANSMISSION CORRIDORS

INTRODUCTION

San Diego Gas & Electric® Company (SDG&E®) is a gas and electric utility delivering clean, safe and reliable service to over 3.6 million residential and business customers with a 4,100 square mile service territory including San Diego county and portions of southern Orange County. SDG&E's gas and electric systems are critical to the energy needs and reliability for southern California and the southwestern United States. For these reasons, SDG&E is concerned with all activities near its gas and electric facilities, especially transmission facilities, that could affect the reliability of the system or SDG&E's ability to operate and maintain the system, and SDG&E is obligated to limit encroachments within SDG&E's fee and easement property to protect the safety and reliability of the system. If there is no other alternative, then the use of SDG&E's fee and easement property is guided by law and the California Public Utilities Commission (CPUC) through its General Orders, Rules and rulings designed to protect the system and the public.

GENERAL

This guide is designed to assist developers and engineers with understanding the standards and requirements that will impact the development of property within or adjacent to SDG&E's existing facilities, especially transmission facilities containing 69kV, 138kV, 230kV and 500kV facilities. Special sections are provided regarding transmission corridors containing overhead electric transmission, underground electric facilities and underground gas transmission pipelines.

Road crossings, both private and public, passive open space areas, golf courses, agriculture uses and short-term parking lots are generally uses which SDG&E deems more compatible near SDG&E facilities. However, any request to encroach upon SDG&E property will require a detailed internal review to determine compatibility with SDG&E's operations and may also be subject to approval by the CPUC pursuant to Public Utilities Code Section 851, et. seq. (Section 851). If a proposed use is approved, the encroachment will be documented in an agreement that may be recorded against the subject property.

This guide is being furnished as an aid to streamline SDG&E's review process and to minimize potential negative impacts to SDG&E's facilities and properties. However, these standards are not exhaustive or complete as aspects of SDG&E's review are technical and cannot be sufficiently detailed in these guidelines. SDG&E standards and requirements are subject to change at any time as a result of changes in applicable law or as required by the CPUC. Thus, these guidelines may be supplemented with additional requirements at any time as SDG&E deems necessary.

Developers and engineers should bear in mind that compliance with the standards and requirements set forth in this guide does not mean an automatic acceptance of your project by SDG&E. These are public safety guidelines only. SDG&E's land rights, operational concerns and regulatory compliance will always be the primary considerations when reviewing submissions.

PERMISSION TO GRADE

A Permission to Grade is a form used by SDG&E to permit grading to occur within SDG&E's easements or fee properties. The Permission to Grade will typically require an additional Consent Agreement, a Right of Way Use Agreement or other form of agreement to be entered into between SDG&E and the developer or owner of the property being graded, depending on the proposed type of encroachment.

Developers must submit grading plans and detailed site development plans (and geotechnical reports if applicable), signed and dated, for SDG&E's review. All SDG&E facilities, existing structures, structure numbers, existing anchors, right of way, easement and property boundaries, document recording information and existing and proposed access roads must be shown on the submitted plans. Upon receipt of plans by SDG&E's Land Management Department, a lead time of at least eight (8) weeks is typical for SDG&E's initial review of plans to assess compatibility of the proposal with SDG&E's existing facilities and utility operations.

It is the developer's sole responsibility to comply with all rules, regulations, permits and orders of Federal, State, County, and local agencies having jurisdiction. For example, the California Department of Education has developed recommendations for minimum distances between schools and transmission lines as part of its school site selection and approval guide. For further information about the guide, contact the California Department of Education.

Also, location of developer's improvements above or below ground and/or adjacent to SDG&E facilities and easement, right of way or other property boundaries requires the developer to comply with California Division of Occupational Safety and Health (CAL-OSHA) and/or the rules for Overhead Electric Line Construction, General Order No. 95 and Underground Electric Line Construction General Order No. 128 CPUC, during their construction, operation and maintenance of those facilities. CAL-OSHA is located at 7575 Metropolitan Drive Suite 204, San Diego, CA 92108, 1-800-963-9424.

Grading without SDG&E's written permission is prohibited within SDG&E's easements, rights of way and other real property. SDG&E will take any necessary steps, including legal action, to stop such activity and have the easement, right of way or other real property restored to its original condition at the developer's expense.

GRADING AND CLEARANCES

Conceptual drawings, tentative maps, layouts, and preliminary and final grading plans should be prepared with the following in mind:

1. **Clearances:** Vertical, horizontal, and radial clearances must, at a minimum, meet those of GO-95, CAL/OSHA, Department of Industrial Relations and the following SDG&E requirements:
    - The minimum vertical clearance from ground to any transmission voltage conductor of 69kV, 138kV and 230kV shall not be less than thirty (30) feet when the conductor is at maximum designed sag as shown on the SDG&E design profiles.
    - The minimum vertical clearance from ground to any transmission voltage conductor of 500kV shall not be less than forty (40) feet when the conductor is at maximum designed sag as shown on the SDG&E design profiles.
    - Clearance shall not be calculated using "everyday" sag. The sag differential varies between “everyday” and “maximum design” sags. All sag calculations will be done by SDG&E at owner’s expense.
    - The minimum horizontal distance required is shown in GO-95 Table 2 clearances using the temperature and loading requirements specified in GO-95 Section 43. All horizontally displaced wire positions will be analyzed by SDG&E at the owner’s expense.

2. **Profile:** Profile drawings submitted to SDG&E shall be drawn to a scale of one hundred (100) feet horizontal and twenty (20) feet vertical, or two hundred (200) feet horizontal and forty (40) feet vertical, and the survey datum shall be specified.

3. **Compaction:** If applicable, all fill shall be engineered and placed to a minimum compaction of ninety percent (90%) maximum dry density as determined by American Society for Testing and Materials (ASTM) D1557, unless specified otherwise. Where there is the possibility of future structures being placed in the rights of way, SDG&E may require compaction to a minimum of ninety-five percent (95%) maximum dry density. SDG&E may require compaction tests to be performed at the developer's expense.

4. **Maintenance/Construction Pads:** All existing structures and all future structure positions shall be provided with maintenance/construction pads as well as working areas as indicated by drawings GD-3 through GD-11 (see appendix), with a maximum two percent (2%) cross slope

and means to provide drainage to prevent ponding. Stringing and construction areas shall remain undisturbed by developer.

5. **Cut/Fill Clearances:** No cut or fill will be allowed within the horizontal distances indicated below, measured from the face of each type of structure or anchor. Once outside the limits specified in the table below, the slopes may be cut or filled at a 2:1 (horizontal:vertical) or flatter.

Structure Type	Distance
Anchor	10’
Direct embedded pole	20’
Steel lattice tower or foundation	20’
Engineered Steel pole or foundation	30’

6. **Retaining System:** Any retaining walls and devices within three (3) times the distance specified in Item 5 will be considered as structurally integral to the transmission structure. All such devices will require SDG&E’s Civil/Structural Engineering Section’s approval prior to SDG&E approval of developer's plans.

7. **Graded Slopes:** Graded slopes of 2:1 (horizontal:vertical) or flatter will be selectively permitted for distances not to exceed two hundred (200) linear feet in the right of way. Longitudinal grading encroachments, cuts or fills may not exceed ten (10) feet into the right of way.

8. **Insulator Washing:** If, in the judgment of SDG&E, any grading, blasting or other activities create excessive contamination, developer will be responsible for additional insulator washing costs incurred by SDG&E.

ROADS AND DRAINAGE

SDG&E’s access roads must be designed to accommodate all types of vehicles used for roadway construction, placement of poles and/or towers, wire stringing, underground installation and maintenance during all phases of construction and maintenance. Developers should comply with the following minimum guidelines and the current edition of the Standard Specifications for Public Works Construction, also known as the “Green Book,” and ensure that adequate access is provided to SDG&E vehicles at all times. Developer is responsible for all necessary permitting including, but not limited to grading permits, environmental permits, and a Storm Water Pollution Prevention Plan (SWPPP), where applicable.

1. **Grading Plans/Improvement Plans:** Existing and proposed access roads will be shown on the grading/improvement plans.

2. **Access:** Access and through access, to and along the rights of way, easements and corridors, are required on a 24-hour basis to all SDG&E facilities, structures, and anchors for patrol, maintenance, and emergency vehicles.

3. **Use:** Access roads shall not be used or dedicated for public or shared use including but not limited to hiking, biking or horse trails.

4. **Widths:** Minimum usable width on all access roads shall be fourteen (14) feet and shall be increased on curves by the distance shown in the table below.

Radius of Curvature	Additional Road Width
75' – 100'	6'
101' – 150'	5'
151' – 200'	4'
201' - 400'	3'
Over 400'	2'

5. **Horizontal Curves:** All road curves shall have a minimum radius of seventy-five (75) feet measured at the centerline of the usable road surface. Inside edge of the curves shall be used as the control for establishing road grades.

6. **Speed Limit:** Unless otherwise required or permitted by SDG&E, unpaved access roads shall be designed for 15 mph.

7. **Wearing Surface:**

Road Grade	Surface
0 –10 percent	Native Soil
11 – 14 percent	Class 2 Base (6" thick)
15 – 20 percent	Concrete (5" over 6" Class 2 Base)

8. **Grades:** Road grades over twelve percent (12%) are discouraged and require special review. Grades of 12% to 20% shall be limited to a length of 250 ft. maximum. Consideration must be given to drainage issues.

9. **Cross Slopes:** The road shall be sloped (2% typical, 4% maximum cross slope) to prevent ponding or damage from undirected water

flow and in accordance with drawing GD-1 (see appendix). When the road is designed to slope away from the cut bank, the water shall be allowed to drain as sheet flow onto the downhill slope (not allowed when slope is fill) unobstructed by drainage swales or berms. When the road is sloped towards the cut bank, a drainage swale along the inside edge of the road shall be provided. Water bars shall also be provided across the road to direct water into the drainage swale. (See Appendix DR-1).

10. **Vertical Curves:** Typically, vertical curves are not necessary in the design and construction of access roads. However, where grade breaks over six percent (6%) occur, the resulting profile should be evaluated against high centering and tail dragging.

11. **Stopping Sight Distance:** Care should be taken to provide stopping sight distance at all intersections with other roadways, public or private. Comply with Caltrans Highway Design Manual, Section 200, for adequate stopping sight distance.

12. **Dead-Ends/Turnarounds:** All dead-end or stub roads over 500 feet in length shall be provided with a Y-type, T-type, or circular type turn-around adequate for truck and emergency vehicles.

13. **Drainage Design:** Drainage systems shall not be designed to discharge on access roads or work pads. Where access roads meet a publicly maintained road, drainage shall be designed to meet the minimum requirement of the municipality or agency having jurisdiction over the publicly maintained road (usually a 100-year storm) and meet current SWPPP requirements. There shall be no diversion from historic runoff.

14. **Dip Section:** Dip sections, where appropriate, shall be constructed at natural grade so as not to impede upstream runoff from crossing the road. (See Appendix DR-2)

15. **Swales:** Brow ditches, swales, etc. should be avoided within the rights of way except transverse to the rights of way. Then they shall be designed to provide heavy construction equipment access. Drainage swales shall be emptied by means of a culvert to the down slope side of the road which then empties onto an energy dissipater or into a natural drainage way.

16. **Culverts:** Corrugated Metal Pipes (CMP) should be used with a minimum cover of two (2) feet. CMP's shall be specified to have a service life of fifty (50) years, based on soil characteristics. Coupling bands and cut-off walls are required. Damaged coating shall be

repaired per manufacturers' recommendation. For CMP use in Orange County, all metal pipes shall be coated with asphalt to meet Orange County's requirements for corrosion resistance. Developer shall design the size of the CMP culvert to meet the 100-year storm requirement or 18" diameter. whichever is greater. Design shall be per San Diego Area Regional Standards. High-density polyethylene dual wall pipes may also be used, except in high fire danger areas.

17. **Bioretention Basins/Energy Dissipaters:** All energy dissipaters, standpipes, desilting basins, bioretention basins, etc. shall be designed to be outside of SDG&E's rights of way. At a minimum, these shall be designed to the requirements of San Diego Area Regional Standard Drawing D-40 or D-41 (also see Appendix 11862-03).

18. **Flume/dip apron:** Where subject to erosion, roadway banks and natural soil shall be protected by galvanized steel intakes (dip aprons) and down slope drains (troughs) (see Appendix 11862-02). Energy dissipaters shall be installed at drain outlets outside of the rights of way.

19. **Water Bars:** Water bars shall be used only if sheet flow off access roads is not practical. Water bars shall be provided across the road to direct water into the drainage swale and minimum design shall meet the requirements shown on drawing DR-1 (see Appendix DR-1). Drainage flows from water bars shall not be directed onto fill slopes, but onto natural, vegetated, undisturbed slopes or into brow ditches if necessary. Water bars shall be open at the lower end to allow drainage and be placed at an approximate angle of 30 to 45 degrees to the transverse section of the road spaced as follows:

Average Road Grade	Maximum Spacing
<5 percent	300 feet
5 percent	125 feet
10 percent	75 feet
15 percent	60 feet
20 percent	50 feet

20. **Loading Requirements:** All private roadways within the rights of way or roads used as access for SDG&E will be sized for heavy construction vehicular traffic (passable with a 100-ton crane and HS-20 loading).

21. **Driveway Entrances:** Commercial aprons must be installed.

22. **Longitudinal Encroachments:** Longitudinal (parallel) encroachments of roads, sewer, water, gas, culverts, drainage culverts, etc., will not be approved.

23. **Utility and Street Crossings:** All utility and street crossings must be kept to a minimum of no more than one every quarter mile and should be designed to cross the rights of way or roadways at as close to ninety (90) degrees as possible. Where access roads intersect paved city or county roads or highways, the design shall be paved or have concrete installed far enough in to minimize vehicle tracking of mud or sediment onto the paved surface, per SDG&E Best Management Practices (BMP).

24. **Maintenance Pads:** See Appendix GD-3 thru GD-10.

25. **Blasting:** Blasting is not permitted on or near the vicinity of SDG&E's rights of way unless written approval is obtained from SDG&E's Land Management, Civil Structural and Gas Transmission Departments, as applicable.

26. **Erosion Control:** All roads and slopes shall have erosion control during and after construction. BMPs shall be applied. Erosion control shall not block access roads at any time. Developer shall assume all responsibilities for obtaining any and all SWPPP approvals and maintaining any and all required BMPs, inspections, repairs and logs, required per the permit and the permitting authority. Developer to supply SDG&E with copies of the SWPPP and BMP permits and plans. Where access roads intersect paved city or county roads or highways, the design shall minimize vehicle tracking of mud or sediment onto the paved surface, per the SDG&E BMP Manual.

FENCES, WALLS, GATES AND OTHER STRUCTURES

Temporary structures, including fences, walls and gates, may be allowed within the rights of way only with written approval from SDG&E in a formal agreement, which may be subject to CPUC approval.

1. **Fences:** Fences and/or walls may be allowed if properly grounded and if access to and along the rights of way is not obstructed and if access to individual structures is not obstructed. (See Appendix 11861-01 through 04).

2. **Gates:** Gates will be required where an SDG&E access road is obstructed. Gates shall meet the following criteria:
    a. All gate openings must be a minimum of fifteen (15) feet in width.
    b. Gates must be at least three hundred (300) feet apart.

c. All gates must have provisions for either an SDG&E standard lock or an electric gate over-ride key.

3. **Lighting Standards:** Lighting standards, up to a maximum of fifteen (15) feet total height, may be located within the rights of way outside of the drip line of the conductor. All lighting standards and metallic objects within the right of way must be properly grounded to prevent exposure to induced currents and voltages per the applicable codes.

4. **High Pressure Valves:** Fire hydrants, air release valves, back flow preventers, post indicator valves, water meters, or any other high-pressure valves shall not be designed to be within the rights of way.

5. **Manholes:** Below ground manholes (sewer, water, CATV, etc.) shall not be designed to be within the rights of way.

6. **Structures:** No permanent buildings or structures are allowed within a transmission right of way.

VEGETATION

Supplemental planting, re-vegetation or mitigation measures will not be placed in, or interfere with SDG&E's existing access roads or existing cleared work areas such as maintenance pads. The developer or landowner will verify the location of existing access roads and work areas with SDG&E and submit a plan for review and approval prior to installing any supplemental planting, re-vegetation or mitigation in SDG&E rights of way.

1. **Supplemental Planting:** So long as it does not interfere with SDG&E's full use and enjoyment of SDG&E's rights of way, SDG&E may, in its sole discretion, allow supplemental planting uses in SDG&E's rights of way if provided with the following items:

   - A biological report describing the quality of the existing vegetation and/or habitat located within SDG&E's rights of way, and

   - A letter from the governing body requiring the developer to plant within SDG&E's rights of way stating that SDG&E will not be penalized for disturbance to the planted area by having to replant or mitigate.

2. **Clearances:** All trees in or adjacent to the transmission right of way shall always comply with the current CPUC General Order 95 Rule 35, the California Public Resource Code Section 4293 and Federal Energy

Regulatory Commission (FERC) FAC 003-1 regarding vegetation clearances from energized conductors. A working zone is required around any structure as indicated in Appendix GD-1 through GD-11. These areas must be kept clear of any obstructions.

3. **Irrigation:** Irrigation systems shall not spray directly onto any gas or electric facilities, access roads or maintenance pads. SDG&E is not responsible for any damage to irrigation systems.

4. **Access:** Planted vegetation shall not restrict SDG&E's access to any of its facilities.

5. **Vegetation Species:** Only trees and low-growing vegetation with a mature height of fifteen (15) feet or less may be permitted within SDG&E's rights of way. The following tree species are offered as examples of trees with a mature height typically not exceeding fifteen (15) feet. However, this is not an exhaustive list, and SDG&E may consider tree species not contained in the following list when the landscape plans submitted are prepared by a licensed landscape architect. These trees may not be acceptable in certain situation where hardware, line sag, construction or terrain become a factor to either reduce tree heights or eliminate trees altogether.

ACACIA cultriformis, Knife Acacia
FOLIAGE: Evergreen – Gray leaves
HEIGHT: Fast growing to 10 – 15'.
FLOWER: Yellow flowers Jan. – Mar.
COMMENTS: Best in full sun. Tolerates wind, drought and most soils.

CEANOTHUS 'Frosty Blue' or 'Ray Hartman'
FOLIAGE: Evergreen – Dark green leaves.
HEIGHT: Moderate growth to 8 – 15'.
FLOWER: Deep blue flowers Mar. – May.
COMMENTS: Best in full sun. Drought tolerant, needs hose water through the first season. Short lived +-10 years. Needs a well drained soil.

CERCIS occidentalis, Western Redbud (Calif. native)
FOLIAGE: Deciduous – Leaves are round & medium green.
HEIGHT: Moderate growth to 15'.
FLOWER: Magenta – Blooms March to April.
COMMENTS: Grows in full sun or part shade. Needs a well drained soil.

DODONAEA viscosa 'Purpurea', Purple Hopbush
FOLIAGE: Evergreen – Willow like bronzy/purple green leaves. Foliage a deeper purple in full sun, more green in shade.
HEIGHT: Fast growing to 12 – 15'.
FLOWER: Insignificant.
COMMENTS: Drought tolerant. Tolerates any soil, wind and heat.

EUCALYPTUS priessiana, Bell Fruited Mallee
FOLIAGE: Evergreen – Gray green leaves.
HEIGHT: Moderate growth to 15'

FLOWER: Yellow flower – Blooms Jan. – Mar.
COMMENTS: Drought tolerant. Tolerates most soils.

LAVATERA assurgentiflora, Tree Mallow (Drought tolerant)
FOLIAGE: Evergreen – Maple like medium green leaves.
HEIGHT: Fast growth to 12'.
FLOWER: Lavender – Blooms year round.
COMMENTS: Grow in full sun. Tolerates drought & poor soil.

MAGNOLIA loebneri
FOLIAGE: Deciduous – Medium green leaves.
HEIGHT: Slow growing to 12 – 15'.
FLOWER: White, Blooms in the spring.
COMMENTS: Grow in sun to part shade. Needs moist, well drained, rich soil.

MAGNOLIA stellata, Star Magnolia
FOLIAGE: Deciduous – Medium green leaves.
HEIGHT: Slow growing to 10'.
FLOWER: White flower. Blooms in the spring.
COMMENTS: Grow in full sun to part shade. Needs moist, well drained, rich soil.

PHOTINIA fraseri
FOLIAGE: Evergreen – Glossy dark green leaves, bronzy new growth.
HEIGHT: Moderate growing to 10'.
FLOWER: White flowers. Blooms in the early spring.
COMMENTS: Berries attractive to birds. Heat resistant and drought tolerant.

PHOTINIA villosa
FOLIAGE: Deciduous – Dark green leaves, pale gold new foliage. Bright red fall color.
HEIGHT: Moderate growth to 15'.
FLOWER: White flowers. Blooms in the spring.
COMMENTS: Grow in full sun and in good soil.

RHAPHIOLEPIS 'Majestic Beauty'
FOLIAGE: Evergreen – Dark green large leaves 4 inches long.
HEIGHT: - Moderate growth to 15'.
FLOWER: Light pink fragrant flowers. Blooms from late fall to late spring.
COMMENTS: Grow in full sun to light shade. Drought tolerant. Tolerates many soil types.

RHUS integrifolia, Lemonade Berry
FOLIAGE: Evergreen – Dark green leaves.
HEIGHT: Moderate growth to 15'.
FLOWER: Pink to white flower. Blooms Feb. – Mar.
COMMENTS: Tolerates wind and drought. Best in a well drained soil.

RHUS ovata, Sugar Bush
FOLIAGE: Evergreen – Glossy dark green leaves.
HEIGHT: Moderate growth to 12'.
FLOWER: White and pink flower. Blooms Mar. to May.
COMMENTS: Tolerates heat and drought. Best in a well drained soil.

THEVETIA thevetiodes, Giant Thevetia (Drought tolerant)
FOLIAGE: Evergreen – Long narrow, glossy, dark green leaves.
HEIGHT: Fast growth to 12'.
FLOWER: Bright yellow, 4". – Blooms from June into winter.
COMMENTS: Best in full sun. They are related to oleander's &, as with oleander, are poisonous.

ACCESS AND ENCROACHMENT DOCUMENTS

Below is a summary of the various documents required for access and encroachment in SDG&E's rights of way and fee property. Unless otherwise specified below, there is a fee applicable for each document listed below, which developer will be advised of the fee amount at the time of request.

Permission to Grade – Easement/Fee: Permits a developer to grade within SDG&E's rights of way and fee property. The Permission to Grade will be issued once submitted plans have been reviewed and approved by SDG&E. The Permission to Grade will generally be included on the grading plans and signed by the appropriate Land Management Representative. SDG&E may be required to seek CPUC approval prior to entering into this agreement.

Right of Way Use Agreement/Consent to Use of Land: This agreement provides for encroachment within SDG&E's easements for uses compatible with SDG&E's existing and proposed future facilities after detailed internal review by SDG&E. SDG&E may be required to seek CPUC approval prior to entering into this agreement.

Signature Omission Letter: This letter is provided to developers in compliance with Government Code §66436, the Subdivision Map Act. It is used when SDG&E has a recorded interest in the property being developed and has reviewed the proposed map to ensure it properly reflects SDG&E's existing rights without encroachments that may be subject to CPUC approval. There is no charge for providing this letter.

Joint Use Agreement: A landowner requesting SDG&E relocate its facilities from a private easement into city or county roads that are subject to a franchise agreement may be required to obtain a joint use and occupancy agreement from the applicable city or county in connection with the relocation. SDG&E may be required to seek CPUC approval prior to entering into this agreement.

Public Utility Letter: This letter is usually requested by a property owner to comply with a public agency's requirement. If SDG&E is able to determine it has no facilities located in a public utility easement or SDG&E's facilities will not be in conflict with the proposed improvement as shown on submitted maps, SDG&E may issue a letter providing no objection to vacation of the public utility easement or providing construction and other safety standards to follow while working around SDG&E's facilities within the public utility easement.

Right of Entry Permit: This permits access onto SDG&E's fee property, easements or rights of way for limited, non-invasive and temporary uses.

SDG&E may be required to seek CPUC approval prior to granting Right of Entry Permits.

Quitclaims: Quitclaims are the relinquishment of an interest in an SDG&E easement or right of way crossing property not owned by SDG&E. SDG&E may be required to seek CPUC approval prior to providing a quitclaim.

RELOCATION OF TRANSMISSION AND DISTRIBUTION FACILITIES

Relocation of transmission and distribution facilities is a complex and costly undertaking and may be subject to both Section 851 authorization and a filing under CPUC General Order 131-D. All costs are borne by the applicant. Engineering and design, special order of material, preparation and negotiation of right of way documents and other agreements, and construction lead times often exceed twelve (12) months. Developer should include the relocation of SDG&E facilities in their California Environmental Quality Act (CEQA) environmental documents for the project to avoid having SDG&E process a separate environmental document for the relocation. This will save time and expenses for the developer. In many cases, early planning with SDG&E may provide alternatives to relocation.

It is SDG&E's policy to relocate transmission or distribution facilities and rights of way only when:

1. No practical alternatives exist.

2. The proposed easement alignment is equal to or better than the original easement, including full access to, from and along the property to the easement. The proposed new alignment would also allow SDG&E to develop the same or better facilities without diminished land rights, including access to the easement over the property. All replacement easements will be documented on current forms.

3. The developer provides all necessary easements for the relocation.

4. All relocation costs will be paid by the developer, and may include, without limitation, the following:

    a. Engineering fees;
    b. Actual costs of removing existing facilities and constructing new facilities;
    c. Differential cost of future construction;
    d. Any increased or additional operating and maintenance costs for the theoretical life of the newly constructed line;
    e. Federal and State taxes;

f. Any loss in land value between SDG&E's existing property and the proposed property for the relocated SDG&E facilities, based on fair market appraised values, and any increase in operational or maintenance costs resulting from the relocation
g. CPUC Section 851 processing fees, if any; and,
h. Environmental and CPUC permitting fees, if any.

It is SDG&E's desire to offer guidance in the early planning stages of a project so satisfactory solutions can be reached. Where CPUC approval may be required, developers should reach out to SDG&E early and plan ahead to avoid unnecessary project delays. For information or assistance contact the Land Management Department at SDG&E at sdgelandservices@sdge.com

OVERHEAD TRANSMISSION RIGHTS OF WAY

Encroachment within SDG&E's transmission rights of way requires special considerations due to special maintenance, access, and safety concerns. Each request for use of SDG&E's overhead transmission rights of way will require a detailed internal review on a case by case basis to determine compatibility with SDG&E's operations and may require approval by the CPUC. If a proposed use is approved, the encroachment will be documented in a formal agreement that may be recorded against the subject property.

The following limitations are considered when reviewing requests for encroachment or use of SDG&E's overhead rights of way:[1]

1. **Permanent Structures:** No permanent structures will be allowed within transmission rights of way.

2. **Temporary Structures:** Any requests for temporary structures within overhead transmission rights of way will be reviewed by SDG&E Transmission Engineering. If approved, such encroachment will require formal documentation in a written agreement with SDG&E that may first be subject to CPUC approval. All temporary structures must have electrical grounds installed from conductive parts of the structure in at least two locations, such as the rain gutter or roof (if the roof is metal).

3. **Grading:** All requests for grading within transmission rights of way shall be reviewed on a case by case basis. At a minimum all requests must comply with the grading requirements described in earlier sections of these guidelines.

[1] These limitations may also apply to distribution rights of way.

4. **Clearances:** Minimum clearance from ground to any transmission conductor shall not be less than forty (40) feet when the conductor is at maximum designed sag as shown on the SDG&E design profiles. Clearance shall not be calculated using "everyday" sag. The sag differential varies between “everyday” and “maximum design” sags. All sag calculations will be done by SDG&E at owner’s expense.

5. **Roads and Drainage:** Any request for modification of access roads within SDG&E’s transmission rights of way shall be reviewed and, if approved, may require documentation in a formal agreement with SDG&E.

6. **Vegetation:** No vegetation shall be planted in or adjacent to transmission rights of way unless reviewed and approved by SDG&E. All existing vegetation in or adjacent to transmission rights of way shall always comply with the current CPUC General Order 95 Rule 35 the California Public Resource Code Section 4293 and FERC FAC 003-1 regarding vegetation clearances from energized conductors.

Any other structure or requested modification of SDG&E’s transmission rights of way shall be reviewed by SDG&E Transmission Engineering. Considerations shall include, but are not limited to:

- Maintaining acceptable levels of induced currents as defined by the National Electrical Safety Code and other applicable industry practices
- Maintaining acceptable levels of step voltages
- Physical safety hazards to the public
- Possible contact of SDG&E facilities by vehicles or equipment
- Providing access for maintenance of SDG&E transmission towers, poles, and other facilities

ELECTRIC TRANSMISSION UNDERGROUND RIGHTS OF WAY[2]

1. **Improvements:** All improvements involving electric transmission underground in SDG&E easements and rights of way must be approved by Transmission Engineering prior to start of work. In addition, such access or encroachment may require formal documentation in a written agreement with SDG&E that may first be subject to CPUC approval.

2. **Heavy Equipment:** Crossing an SDG&E right of way or easement, which may contain an electric transmission underground trench line or manhole, with heavy equipment requires prior SDG&E approval.

[2] Some restrictions may also apply to distribution rights of way

3. **Cover:** Minimum required cover over transmission underground is 36" to top of conduit. Maximum fill or cover allowed over transmission underground is 48" to top of conduit. In some cases, with prior SDG&E approval, minimal additional fill may be allowed for a limited distance

4. **Manholes:** No fill is allowed over transmission manholes or handholes.

5. **Crossings:** All utility crossings should be as close to ninety (90) degrees as possible with an eighteen (18) inch vertical separation. Utility crossings will be kept to a minimum and may require formal documentation in a written agreement with SDG&E that may first be subject to CPUC approval.

6. **Separation:** A minimum of twenty (20) feet horizontal separation should be maintained for 230kV circuits. A minimum of ten (10) feet separation should be maintained for 138kV circuits and five (5) feet separation for 69kV circuits.

7. **Restrictions:** The following are not allowed in an underground transmission easement or right of way:

    a. Distribution or Foreign Utilities (except crossings with approval)
    b. Distribution or Foreign Utility manholes or padmounts
    c. Drainage outlets
    d. Drainage culverts
    e. Multiple sprinkler crossings
    f. Sprinkler heads
    g. Permanent structures
    h. Trees and shrubs

8. **Slopes:** No fill slopes or cut slopes will be allowed within underground transmission easements and rights of way.

9. **Erosion:** No temporary or permanent ponding of water or water erosion will be allowed within underground transmission easements or rights of way.

10. **Access:** No trees are to be planted within the underground transmission easements or rights of way. Ground cover will be allowed, but SDG&E vehicle access must be maintained to and along the underground easement.

11. **Potholing:** Electric underground transmission lines must be potholed at developer's expense prior to start of any work on a site to verify horizontal and vertical location of the transmission line(s). Results of potholing to be submitted to SDG&E Transmission Engineering for review and approval.

Upon request, SDG&E will pothole the line(s) at the owner's expense or the owner may pothole the line(s) with a qualified electrical standby on site. Pothole locating will be hand dug without the use of mechanical equipment within two (2) feet of any portion of the underground transmission line(s). Hydro-excavation methods are prohibited on any direct-buried cable systems.

GAS TRANSMISSION RIGHTS OF WAY[3]

SDG&E gas transmission lines are the main source of gas to San Diego City and County. The operating pressure of these lines ranges from 595 PSI to 800 PSI. Most of the gas transmission pipeline system is protected by easements granted to SDG&E, and the remainder lies within SDG&E-owned property. The following restrictions allow SDG&E to continue to maintain and operate a safe and reliable system. These restrictions are to preserve pipeline integrity and personal safety of all persons doing work over or near SDG&E's underground gas pipelines.

Encroachment within SDG&E's gas transmission easements and rights of way requires special consideration due to maintenance, access and safety concerns. Each request to encroach within SDG&E's gas transmission easements or rights of way will require a detailed internal review on a case by case basis to determine compatibility with SDG&E's operations and may also be subject to approval by the CPUC.

All improvements involving SDG&E gas transmission lines must be approved by the Miramar District Gas Transmission Department and SDG&E Land Management Department. Once approved by SDG&E, a Permission to Grade and other applicable formal agreement with SDG&E will be required to document the encroachment, which may first be subject to CPUC approval.

Any construction that causes interference or may interfere with SDG&E's easement rights, without a Permission To Grade and other applicable formal agreement required by SDG&E, will be cause for appropriate action by SDG&E including immediate stoppage of all work on the site and possible removal of such improvements.

The following restrictions are listed to aid in the design of improvements. However, these standards are not exhaustive or complete as aspects of SDG&E's review are technical and cannot be sufficiently detailed in these guidelines. Thus, these guidelines may be supplemented with additional requirements at any time as SDG&E deems necessary.

1. **Heavy Equipment:** Crossing gas transmission lines with heavy equipment requires prior written approval by SDG&E. An SDG&E representative must be

[3] Some restrictions may also apply to distribution rights of way.

on-site while any work is being done within ten (10) feet of the gas main to monitor safety precautions.

2. **Cover:** The maximum cover allowed over a gas transmission main is eight (8) feet. The minimum is thirty-six (36) inches. Due to erosion or other factors, the gas main may have less or more than thirty-six (36) inches of cover. The developer will fill to minimum required cover, whenever necessary. Depending on the existing cover, an additional fill in excess of the required minimum may be permitted after careful consideration and approval of SDG&E.

3. **Crossings:** All utility crossings are to be as close to ninety (90) degrees as possible and an eighteen (18) inch minimum vertical separation maintained. Utility crossings will be kept to a minimum and may require formal documentation in a written agreement with SDG&E that may first be subject to CPUC approval. Multiple crossings for sprinkler systems are not allowed. No parallel facilities, buildings, underground facilities, structures, etc., will be allowed in the easement.

4. **Improvements:** No structures, above or below ground, will be permitted within the easement or easement setback without written consent from SDG&E, which may require formal documentation in a written agreement with SDG&E that may first be subject to CPUC approval. Structures are considered to be pipelines, storm drains, sprinkler systems, etc.

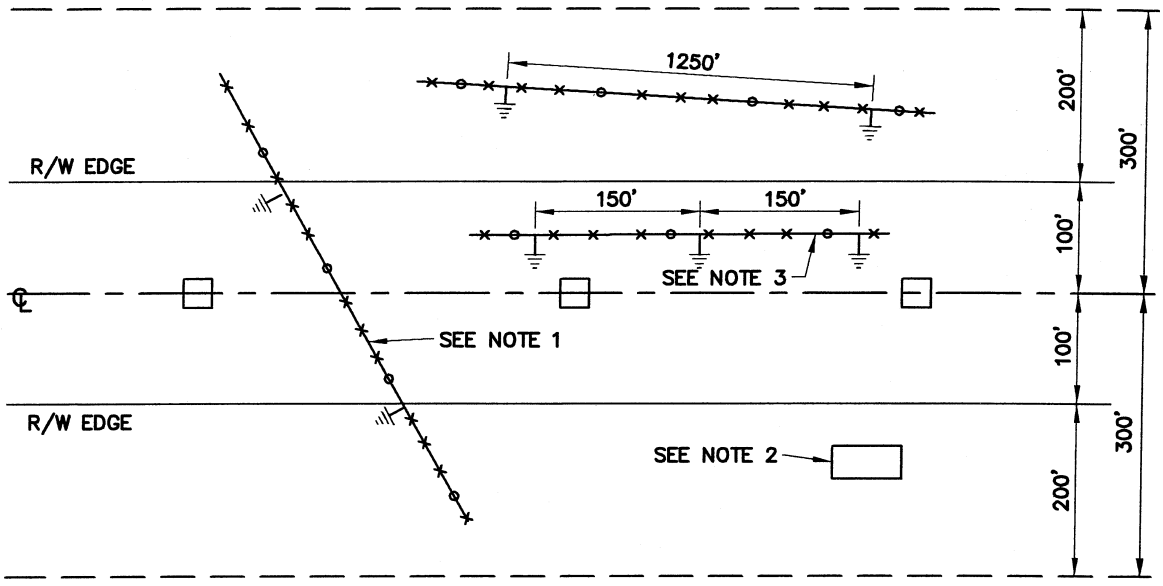
5. **Slopes:** No fill slopes or cut slopes will be allowed within gas easements or rights of way. Grading for development must not cause ponding or water erosion within the gas easements or rights of way.

6. **Vegetation:** No trees, shrubs or other large rooted plants are to be planted within the easement. Ground cover will be allowed however, SDG&E vehicle access to and along the gas mains must be maintained.

7. **Potholing:** Gas transmission lines within the area of work must be potholed at developer's expense prior to start of any work to verify horizontal and vertical location of the gas main(s). Upon request, SDG&E will pothole the main(s) at the owner's expense or the owner may pothole the main with an SDG&E standby representative on site. Pothole locating will be hand dug without the use of mechanical equipment with the exception of air vacuum and water vacuum potholing within two (2) feet of any portion of the gas pipeline.

8. **Parking:** Parking stalls will not be allowed over any existing gas transmission lines, vaults or appurtenances.

APPENDIX



NOTES:

1. FENCES CROSSING THE TRANSMISSION LINE AT AN ANGLE GREATER THAN 30°, ONE GROUND SHALL BE INSTALLED WHERE THEY ENTER & EXIT THE RIGHT– OF– WAY.
2. METALLIC STRUCTURES WITHIN 200 FEET OF THE EDGE OF THE RIGHT–OF–WAY SHALL BE GROUNDED.
3. FENCES WITHIN THE RIGHT–OF–WAY WILL BE GROUNDED AT 150 FOOT INTERVALS & WHERE THEY ENTER & EXIT THE RIGHT–OF–WAY.
4. FENCES WITHIN 200 FEET OF THE EDGE OF THE RIGHT–OF–WAY CROSSING AT AN ANGLE OF LESS THAN 30° OR PARALLEL TO THE TRANSMISSION LINE SHALL BE GROUNDED AT 1250 FOOT INTERVALS.
5. SUPERSEDES DWG. # TA2501

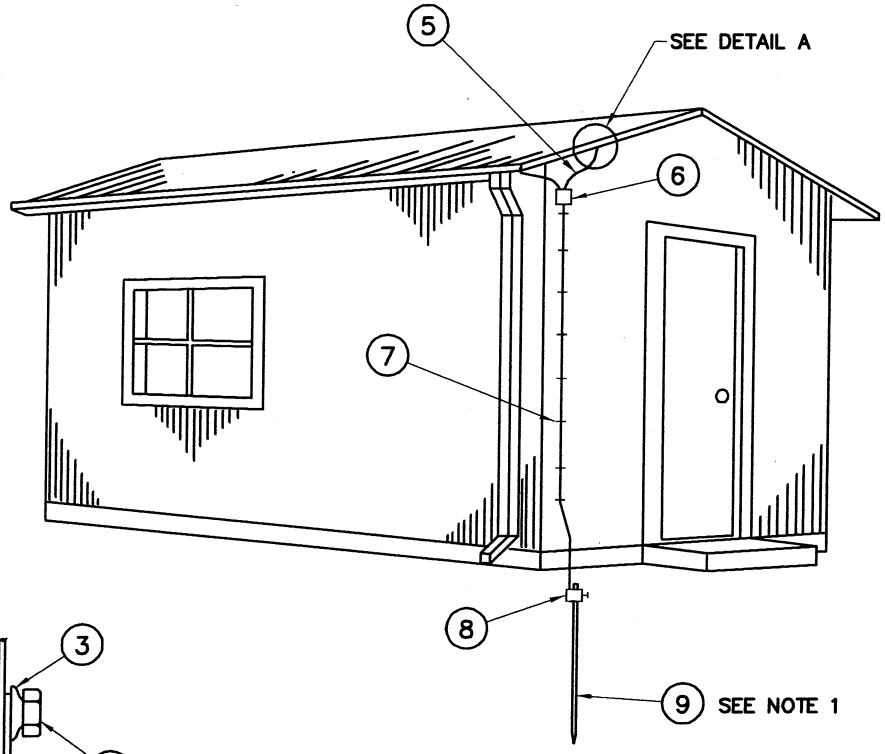
REV	BUDGET	CONST ORDER	CHANGE	DWN	CHKD	APPV	APPV	DATE
B								
A								
			ORIGINAL	WDF	SAC	WVT		10/9/01

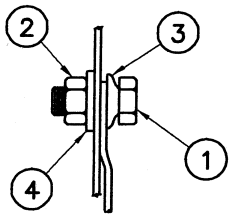
SDGE SAN DIEGO GAS & ELECTRIC
TRANSMISSION ENGINEERING

GROUNDING
GROUNDING REQUIREMENTS

SCALE: NONE
SHEET 1 OF 4

11861–01





DETAIL A

ITEM	DESCRIPTION
1	BOLT, 1/4" x 1" STAINLESS STEEL
2	NUT, 1/4" STAINLESS STEEL
3	WASHER, BELLEVILLE, 1/4" STAINLESS STEEL
4	WASHER, FLAT, 1/4" STAINLESS STEEL
5	WIRE, 1/4", 3 STR. GALVANIZED STEEL
6	CONNECTOR, BURNDY CAT. NO. KSU 22 OR EQUIVALENT
7	CLIP, WIRE
8	CLAMP, GROUND ROD, 5/8" BURNDY CAT. NO. GKP 635 OR EQUIV.
9	GROUND ROD, 5/8" x 8' COPPERWELD

NOTE:

1. GROUND ROD TO BE INSTALLED 8" MIN. BELOW GRADE.
2. SUPERSEDES DWG. # TA2502

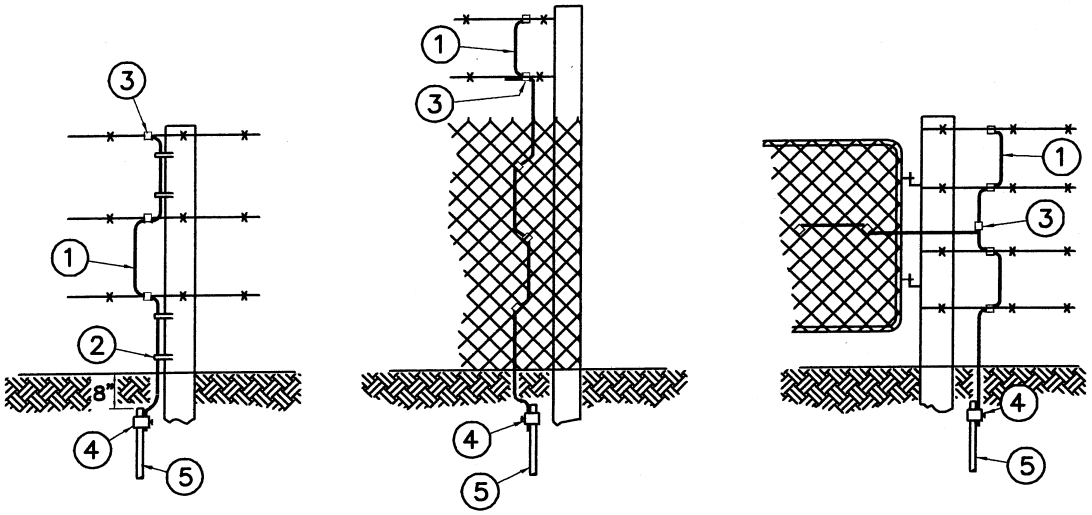
REV	BUDGET	CONST ORDER	CHANGE	DWN	CHKD	APPV	APPV	DATE
B								
A								
			ORIGINAL	WDF				

SDGE SAN DIEGO GAS & ELECTRIC
TRANSMISSION ENGINEERING

GROUNDING
METALLIC STRUCTURES
(TYPICAL)

SCALE: NONE
SHEET 2 OF 4

11861-02



ITEM	BILL OF MATERIALS DESCRIPTION
1	WIRE, 1/4" 3 STR. GALVANIZED STEEL
2	FENCE STAPLE, 1 1/4" GALVANIZED
3	CONNECTOR, BURNDY TYPE KSU OR EQUIV., SIZE TO FIT
4	CLAMP, GROUND ROD, 5/8" BURNDY CAT. NO. GKP 635 OR EQUIV.
5	GROUND ROD, 5/8" x 8' COPPERWELD

NOTE:

1. SUSP. DWG. # TA2503

REV	BUDGET	CONST ORDER	CHANGE	DWN	CHKD	APPV	APPV	DATE
B								
A								
			ORIGINAL	WDF	SAL	WVT		10/16/01

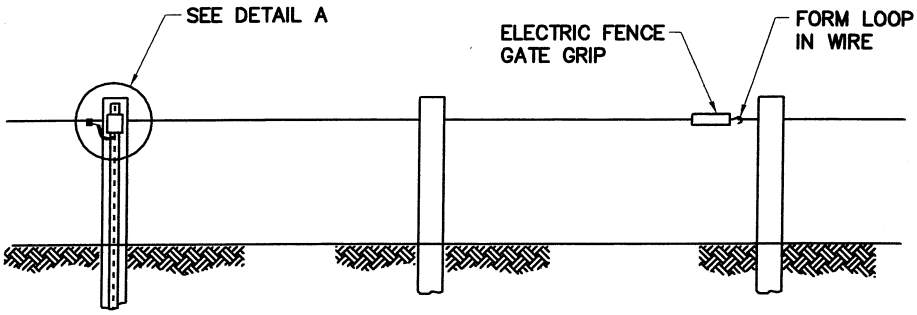
SDGE SAN DIEGO GAS & ELECTRIC
TRANSMISSION ENGINEERING

GROUNDING
GATES & FENCES

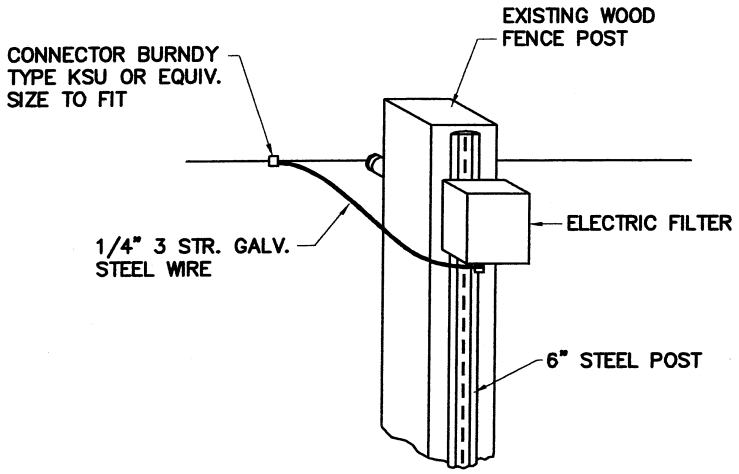
SCALE: NONE

SHEET 3 OF 4

11861-03



TYPICAL ELECTRIFIED WIRE FENCE



DETAIL A

NOTES:

1. 6' STEEL POST SHALL BE INSTALLED AS CLOSE TO EXISTING POST AS POSSIBLE. STEEL POST SHALL NOT BE INSTALLED IF EXISTING FENCE POST IS STEEL.
2. ELECTRIC FILTER SHALL BE AS FURNISHED BY SYNDYNE CORP. 2001 ROOSEVELT AVE., VANCOUVER, WASHINGTON 98660.
3. SUPERSEDES DWG. # TA2504

REV	BUDGET	CONST ORDER	CHANGE	DWN	CHKD	APPV	APPV	DATE
B								
A								
			ORIGINAL	WDF	[signature]	[signature]		10/9/01

SDGE

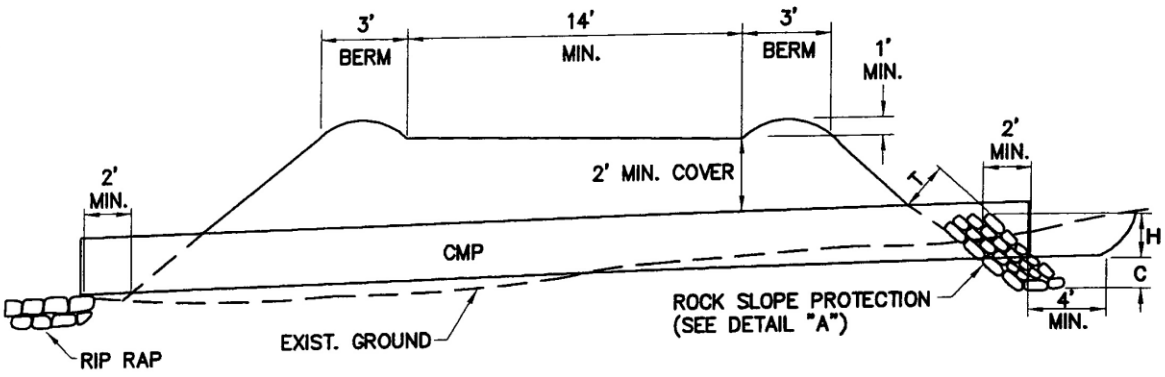
SAN DIEGO GAS & ELECTRIC
TRANSMISSION ENGINEERING

GROUNDING
ELECTRIC FENCES

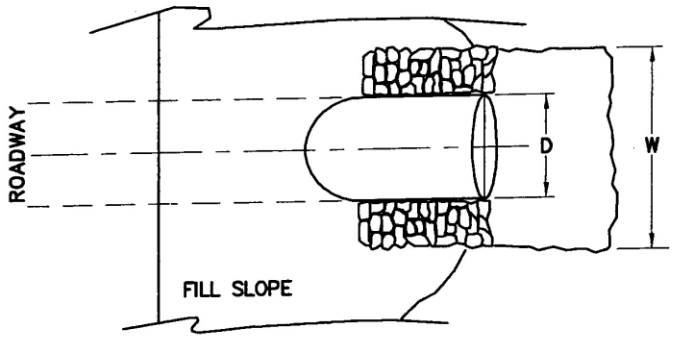
SCALE: NONE

SHEET 4 OF 4

11861-04



TYPICAL CULVERT INSTALLATION



DETAIL "A"
ROCK SLOPE PROTECTION

D	W	C	H
18"	3.5'	2.0'	1.0'
24"	4.5'	2.5'	1.0'
36"	5.0'	3.0'	1.5'
48"	8.0'	3.0'	2.0'
60"	11.0'	3.0'	3.0'

FL. SLP	STONE* SIZE	T
5%	NONE	—
10%	1.5'	2.0'
15%	2.5'	4.0'
20%	3.0'	5.0'

NOTES:

1. * – 60% OF STONES SHALL BE STONE SIZE OR LARGER. 30 % OF STONES MAY BE LESS THAN 1/5 STONE SIZE.
2. SUPERSEDES DWG. # TA2459

REV	BUDGET	CONST ORDER	CHANGE	DWN	CHKD	APPV	APPV	DATE
B								
A								
			ORIGINAL	WDF		JHW		6/16/01

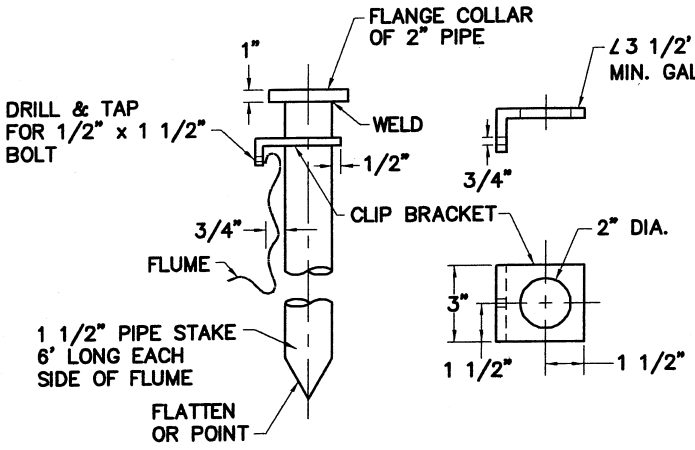
SDGE SAN DIEGO GAS & ELECTRIC
TRANSMISSION ENGINEERING

ACCESS ROAD DETAILS
CULVERTS

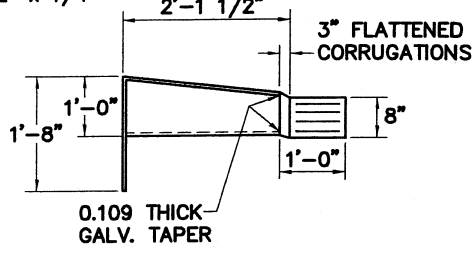
SCALE: NONE

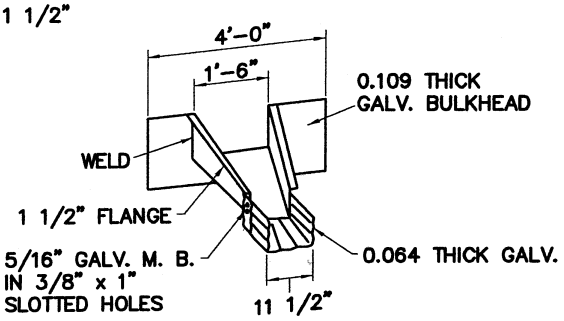
SHEET 1 OF 10

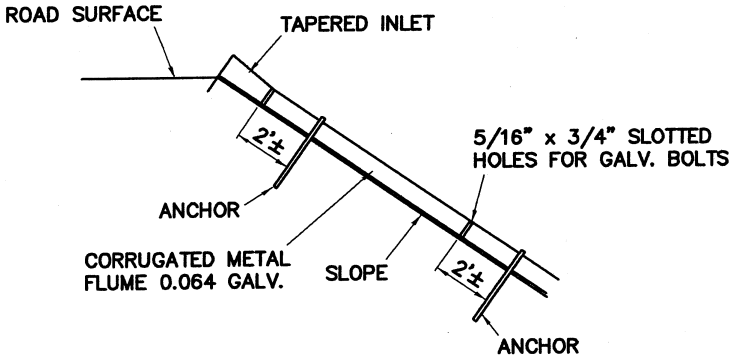
11862-01



ANCHOR DETAIL







ELEV.

TAPERED INLET

NOTE:
1. ALL METAL PARTS TO BE GALVANIZED AFTER FABRICATION.

TAPERED INLET & DOWNDRAIN FLUME

NOTE:
1. SUPERSEDES DWG. # TA2460

REV	BUDGET	CONST ORDER	CHANGE	DWN	CHKD	APPV	APPV	DATE
B								
A								
			ORIGINAL	WDF				

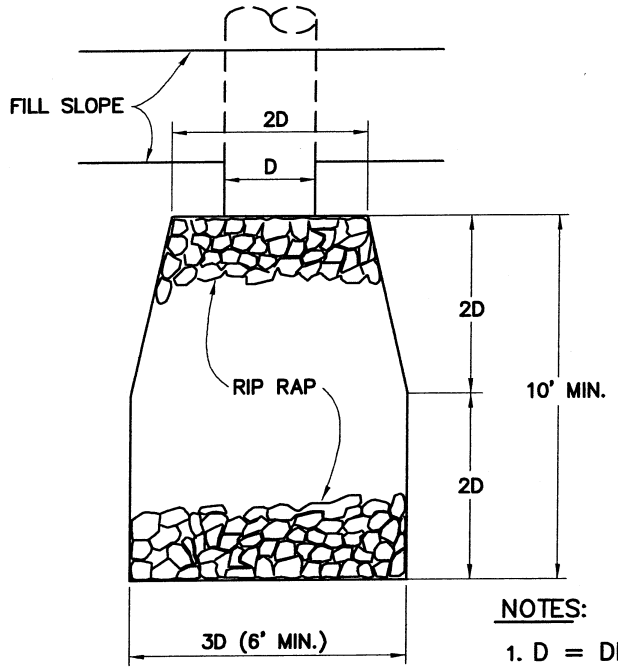
SDGE SAN DIEGO GAS & ELECTRIC
TRANSMISSION ENGINEERING

ACCESS ROAD DETAILS
DOWN DRAINS

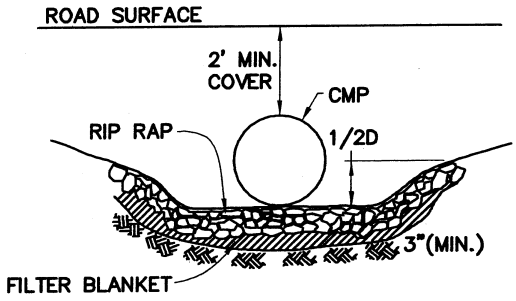
SCALE: NONE

SHEET 2 OF 10

11862-02



PLAN VIEW



ELEVATION

NOTES:

1. D = DIAMETER
2. TYPE OF RIP RAP
   A. REGULAR QUARRY STONE
   B. BROKEN CONCRETE
3. PLACEMENT
   A. MIN. DEPTH 1 1/2 TIMES AVERAGE STONE SIZE.
   B. ROCKS SHALL BE PLACED SO AS TO PROVIDE A MIN.OF VOIDS.
   C. SURFACE ROCKS OR CONCRETE SHALL PROTRUDE TO AT LEAST 1/2 THEIR VERTICAL DIMENSION.
   D. RIP RAP SHALL BE PLACED OVER A FILTER BLANKET WHICH MAYBE EITHER GRANNULAR MATERIAL OR FILTER CLOTH.
4. SUPERSEDES DWG. # TA2461

REV	BUDGET	CONST ORDER	CHANGE	DWN	CHKD	APPV	APPV	DATE
B								
A								
			ORIGINAL	WDF	[illegible]	[illegible]	WPT	10/16/01

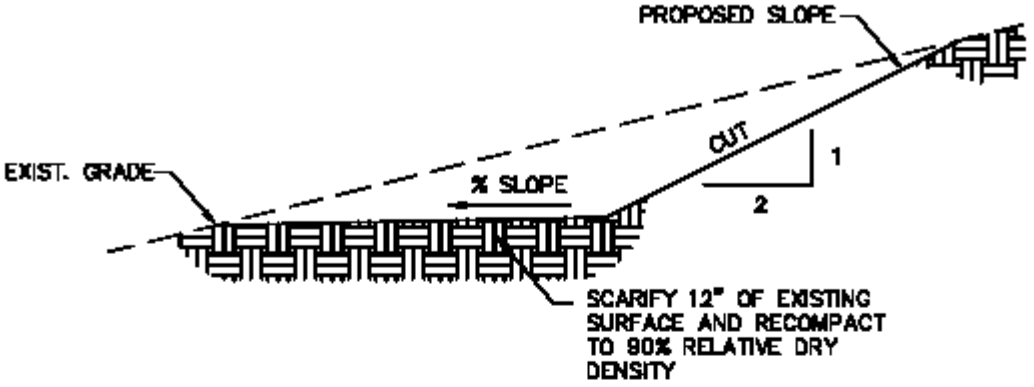
SDGE SAN DIEGO GAS & ELECTRIC
TRANSMISSION ENGINEERING

ACCESS ROAD DETAILS
ENERGY DISSIPATOR

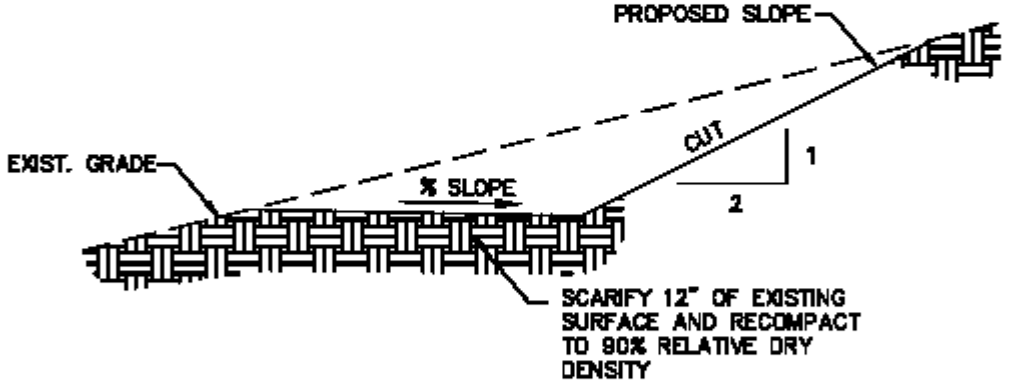
SCALE: NONE

SHEET 3 OF 10

11862-03



PREFERRED SECTION – SHEET FLOW



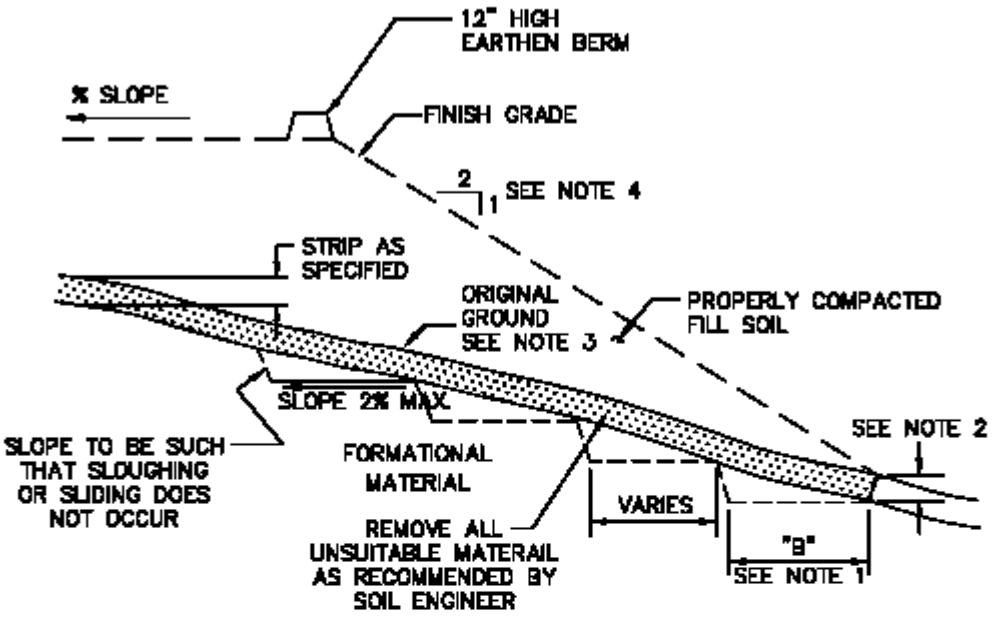
ALTERNATE SECTION

NOTES:

1. CUT SLOPES IN SOIL SHALL BE 2:1 MAXIMUM UNLESS OTHERWISE APPROVED BY SDG&E CIVIL/STRUCTURAL ENGINEERING MANAGER.
2. CUT SLOPES IN SOLID ROCK MAY BE ½:1 MAXIMUM.
3. 4% MAXIMUM CROSS SLOPE FOR ROADS. 2% MAXIMUM CROSS SLOPE FOR STRUCTURE PADS

SDGE

TYPICAL CUT SECTIONS	GD–1

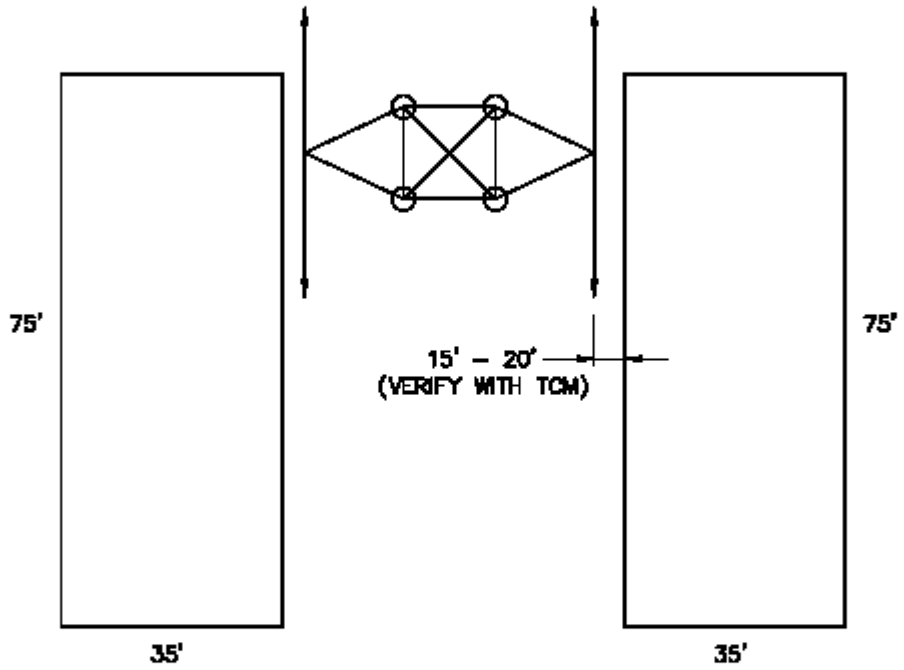


NOTES:

1. THE MINIMUM WIDTH "B" OF KEY SHALL BE 2 FEET WIDER THAN THE COMPACTION EQUIPMENT, AND NOT LESS THAN 10 FEET.
2. THE OUTSIDE EDGE OF THE BOTTOM KEY SHALL BE BELOW TOPSOIL OR LOOSE SURFACE MATERAIL AND AT LEAST 3 FEET INTO DENSE FORMATIONAL MATERIAL.
3. KEYS ARE REQUIRED WHERE THE NATURAL SLOPES ARE STEEPER THAN 6 HORIZONTAL TO 1 VERTICAL, OR WHERE SPECIFIED BY SOIL ENGINEER.
4. FILL SLOPES SHALL BE A 2:1 MINIMUM UNLESS OTHERWISE APPROVED THE THE SDG&E CIVIL/STRUCTURAL ENGINEERING MANAGER.
5. 4% MAXIMUM CROSS SLOPE FOR ROADS. 2% MAXIMUM CROSS SLOPE FOR STRUCTURE PADS.

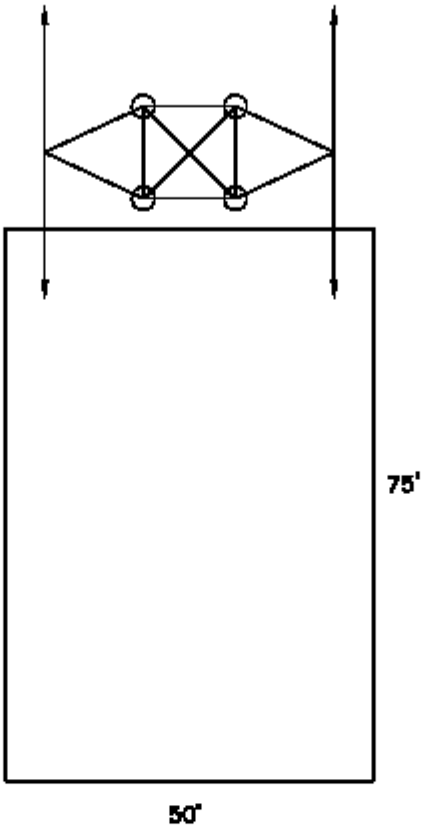
SDGE

TYPICAL FILL SECTION	GD–2



SDGE

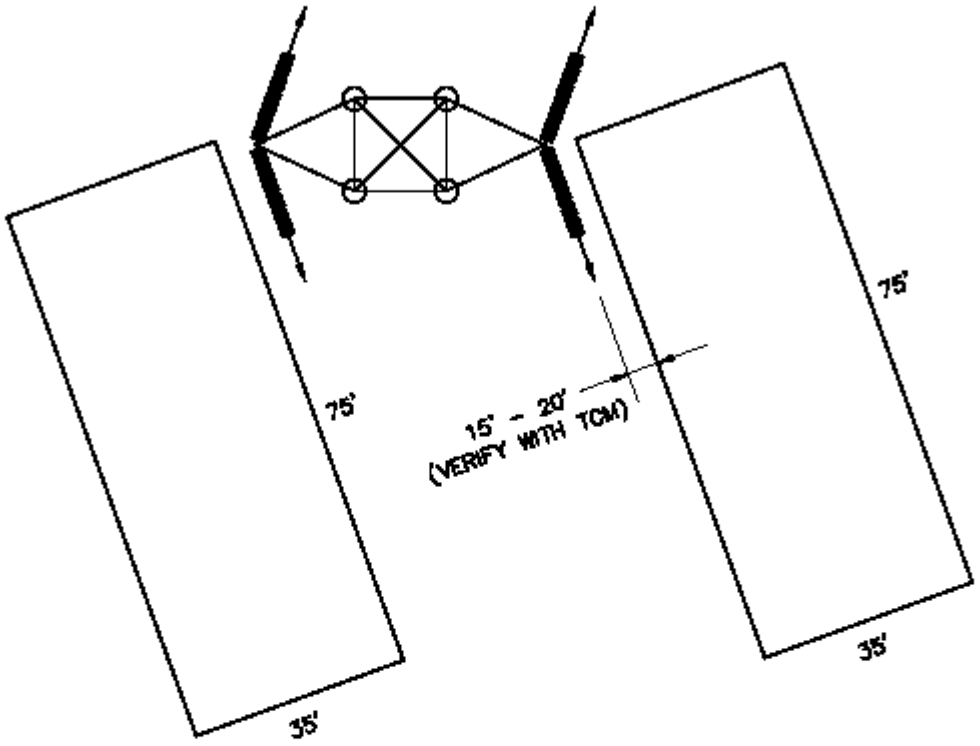
69kV, 138kV, 230kV PREFERRED TANGENT STRUCTURE PADS SIZE AND ORIENTATION	GD–3



NOTE:
FOR PREFERRED PAD SIZE AND ORIENTATION SEE GD-3

SDGE

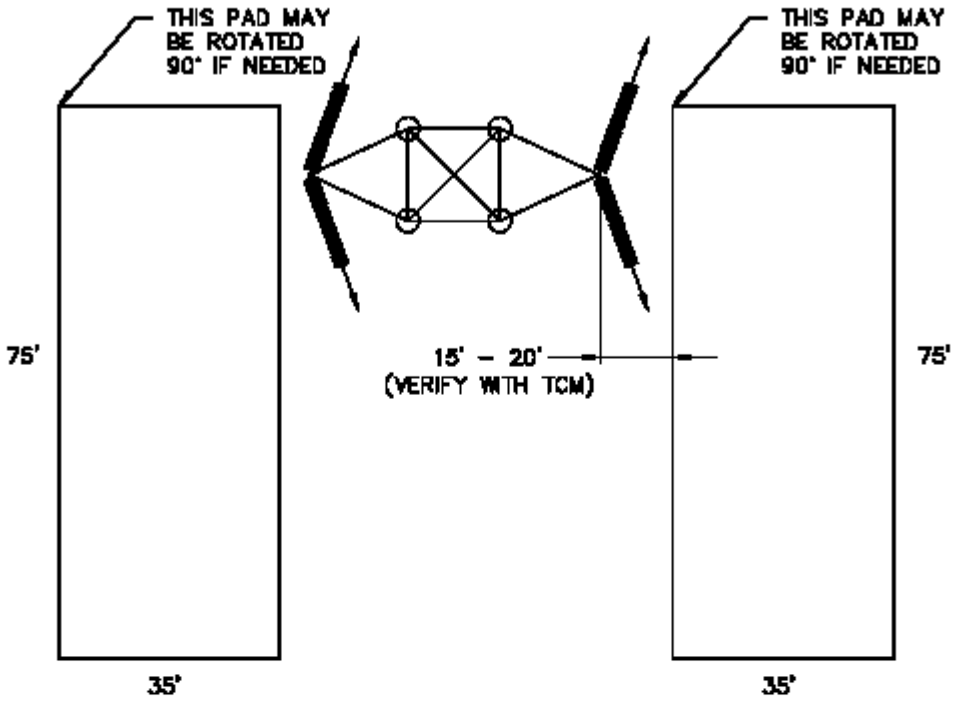
69kV, 138kV, 230kV ALTERNATE TANGENT STRUCTURE PAD SIZE AND ORIENTATION	GD-4



NOTE:
PADS MAY BE ROTATED 90° IF NEEDED

SDGE

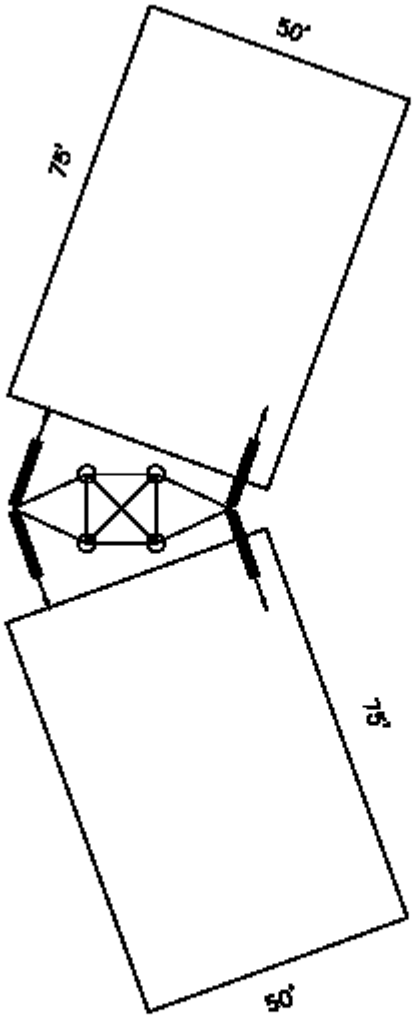
69kV, 138kV, 230kV PREFERRED DEADEND STRUCTURE PADS SIZE AND ORIENTATION	GD–5



NOTES:
1. THIS IS THE PREFERRED OPTION.
2. PADS MAY BE ROTATED 90° IF NEEDED

SDGE

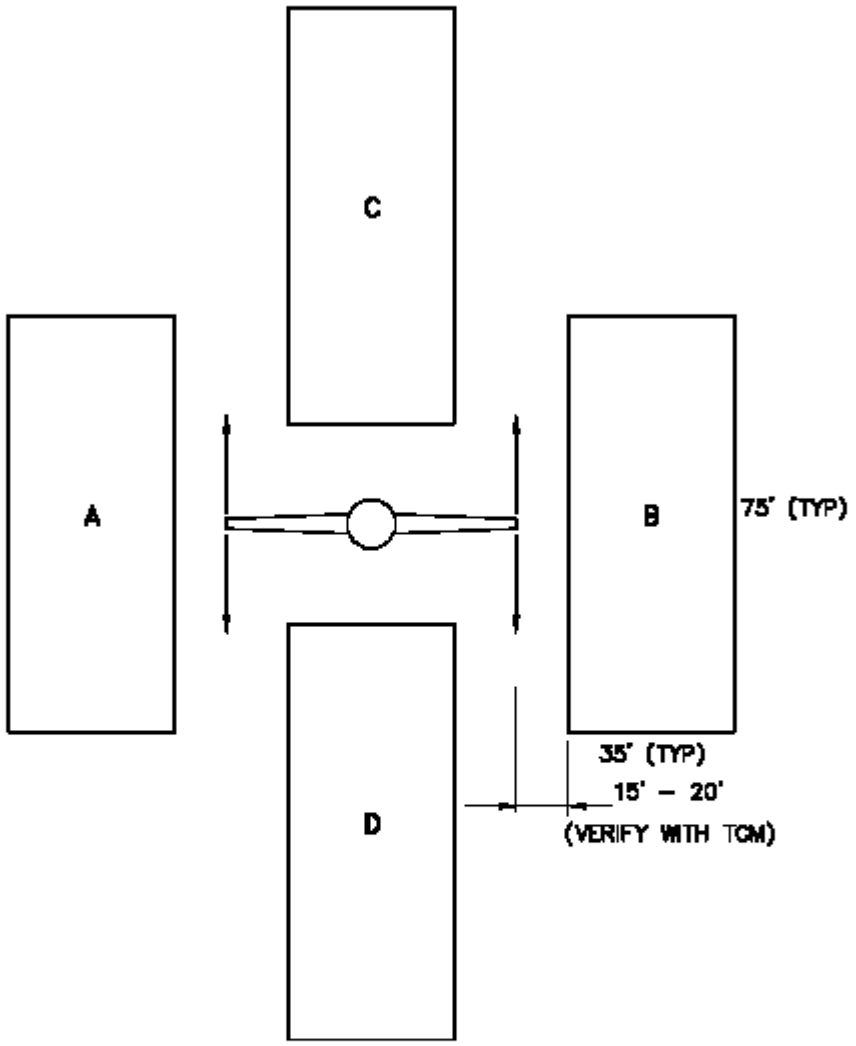
69kV, 138kV, 230kV ALTERNATE 1 DEADEND STRUCTURE PADS SIZE AND ORIENTATION	GD–6



NOTE:
PADS MAY BE ROTATED 90° IF NEEDED

SDGE

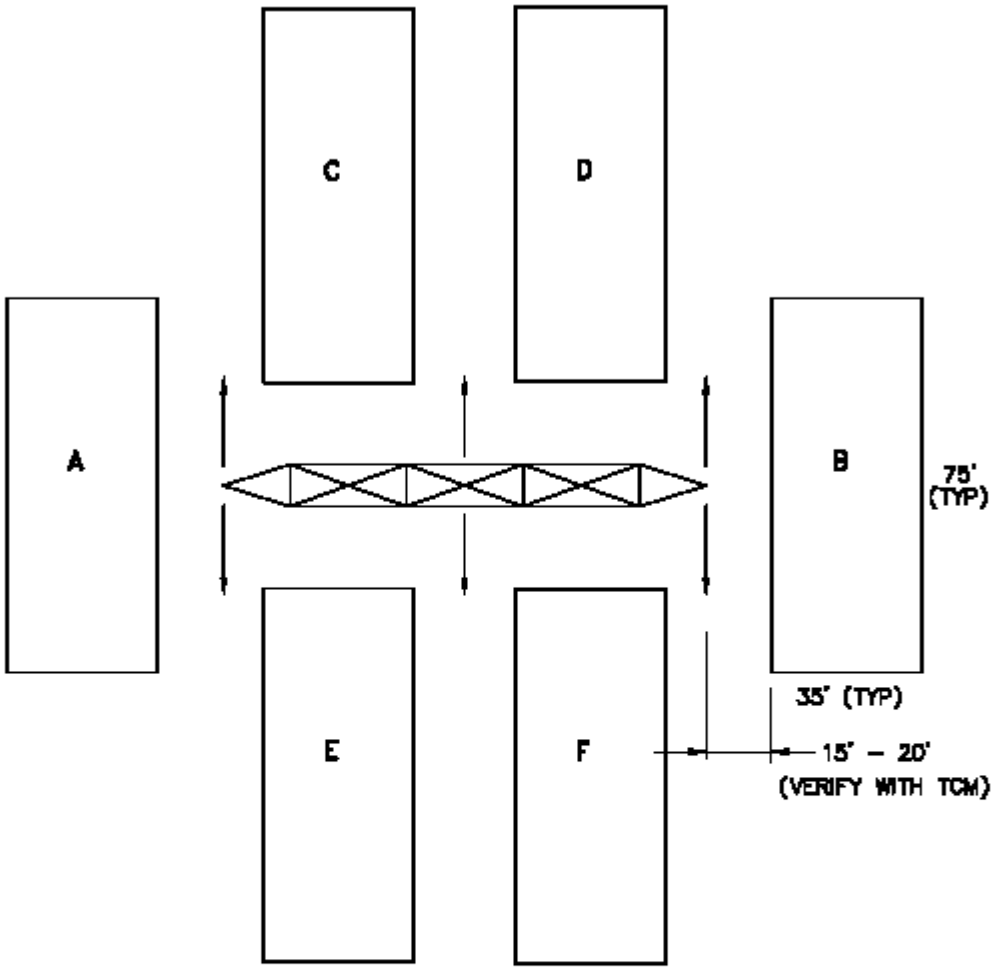
69kV, 138kV, 230kV ALTERNATE 2 DEADEND STRUCTURE PADS SIZE AND ORIENTATION	GD–7



NOTES:
A AND B PADS ARE REQUIRED. IN ADDITION, EITHER C OR D PAD IS REQUIRED, BUT NOT BOTH. THREE (3) TOTAL PADS ARE REQUIRED.

SDGE

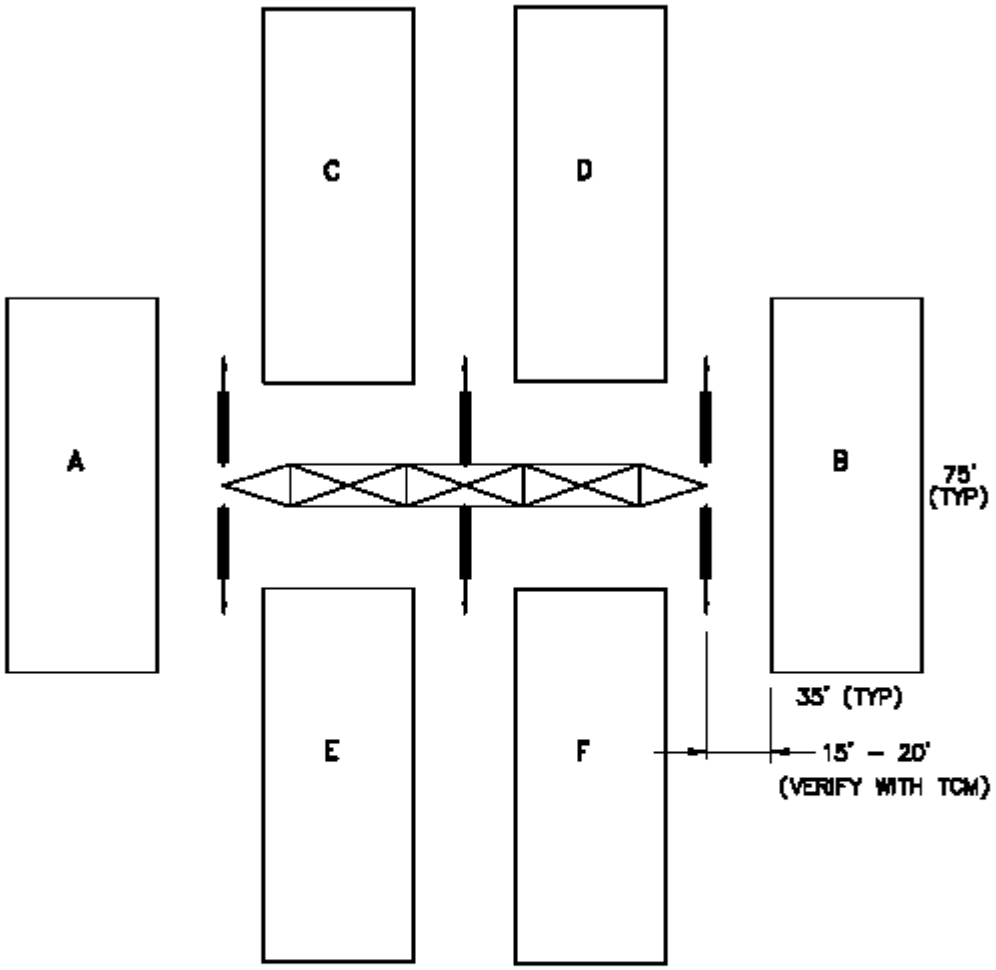
500kV STEEL POLE PAD REQUIREMENTS	GD–8



NOTE:
A AND B PADS ARE REQUIRED. IN ADDITION, EITHER PAD C OR D OR E OR F IS REQUIRED. THREE (3) TOTAL PADS ARE REQUIRED.

SDGE

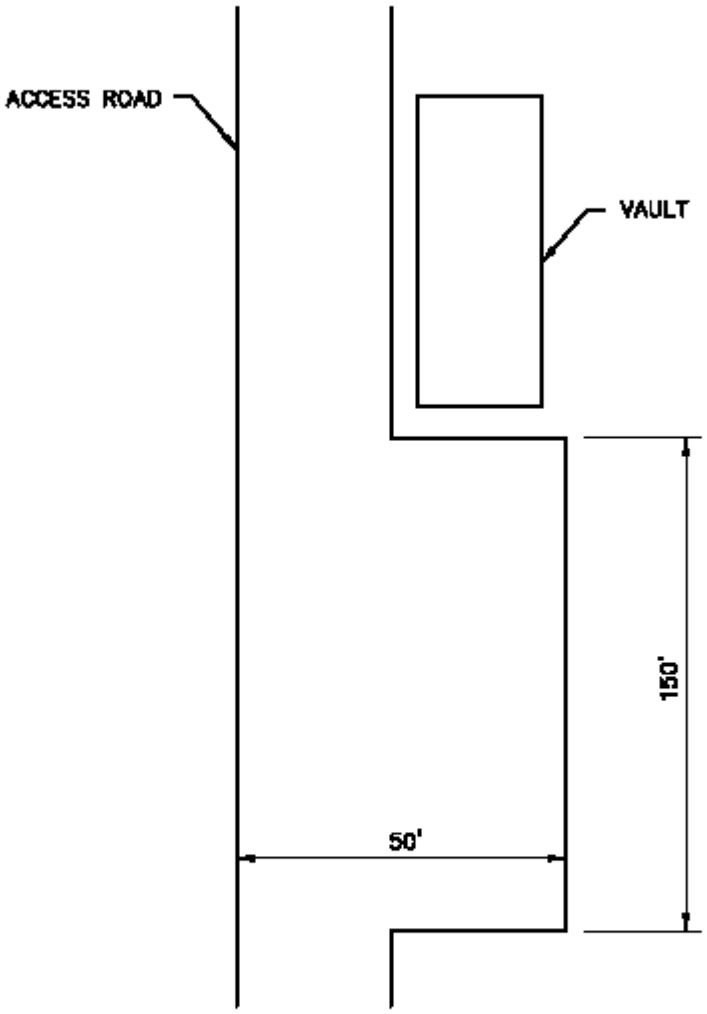
500kV TANGENT LATTICE TOWER PAD REQUIREMENTS	GD–9



NOTES:
A AND B PADS ARE REQUIRED. IN ADDITION, EITHER PAD C OR D, PLUS PAD E OR F ARE REQUIRED. FOUR (4) TOTAL PADS ARE REQUIRED.

SDGE

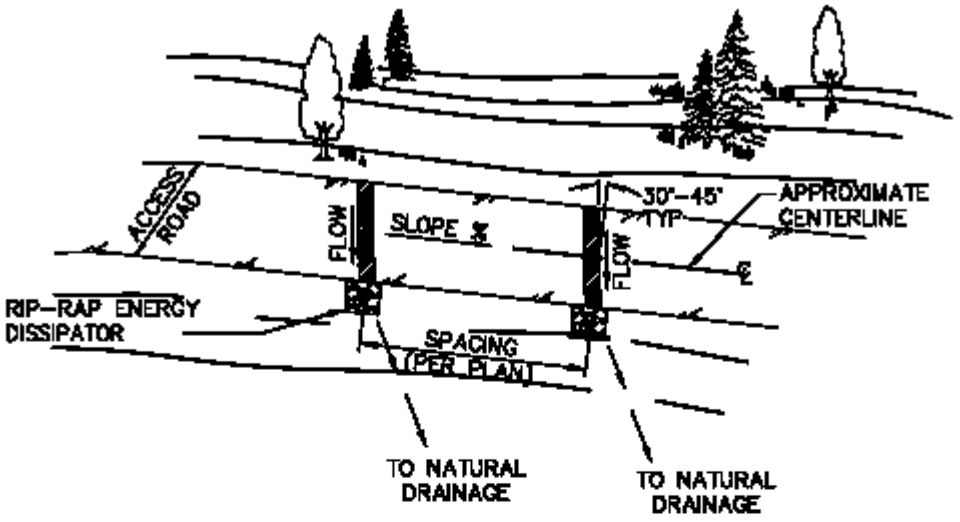
500kV DEAD END LATTICE TOWER PAD REQUIREMENTS	GD–10



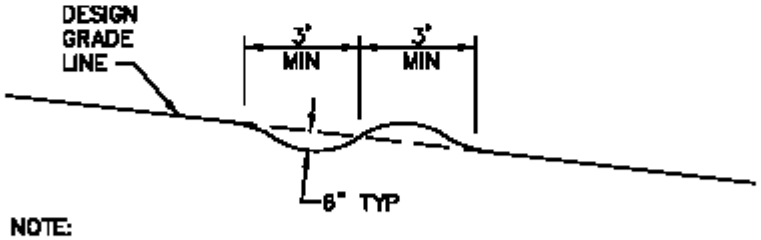
TYPICAL SECTION

SDGE

TYPICAL VAULT SETTING PAD SIZE AND ORIENTATION	GD–11



PLAN

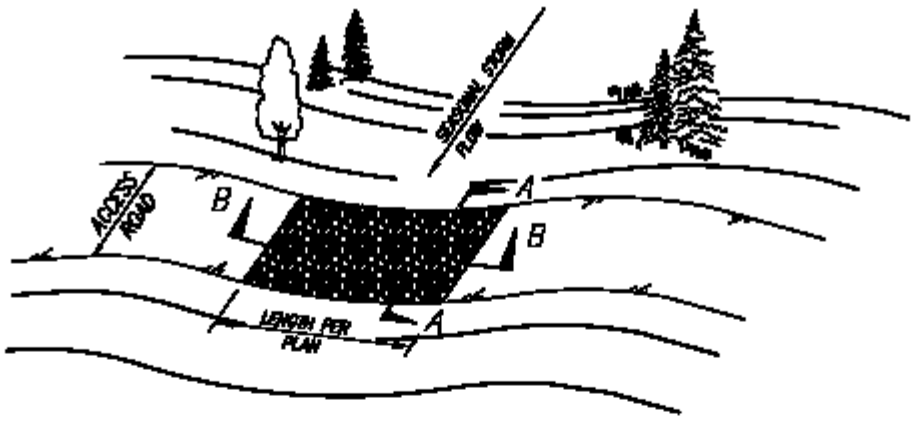


NOTE:
THE RIDGE OF EACH WATERBAR IS TO BE MAINTAINED AT AN ELEVATION AT LEAST 6 INCHES ABOVE THE ADJACENT DEPRESSION

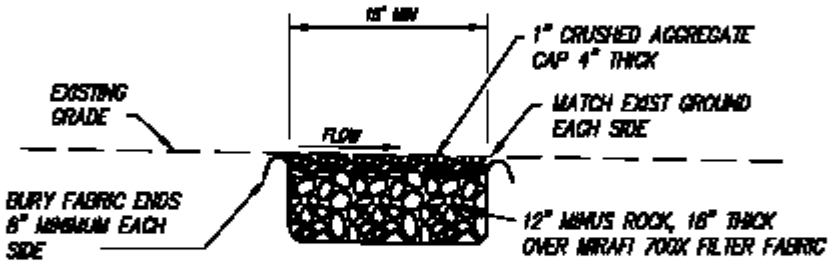
TYPICAL SECTION

SDGE

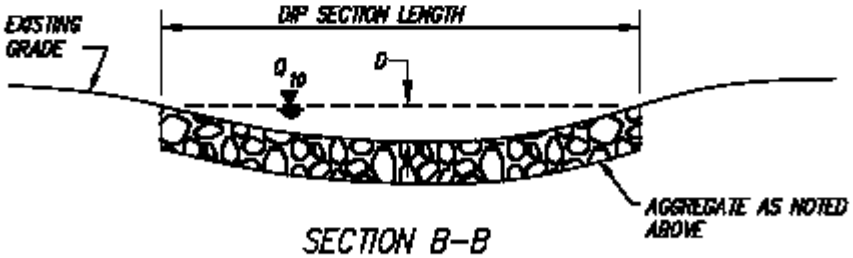
WATER BAR	DR–1



PLAN



SECTION A–A



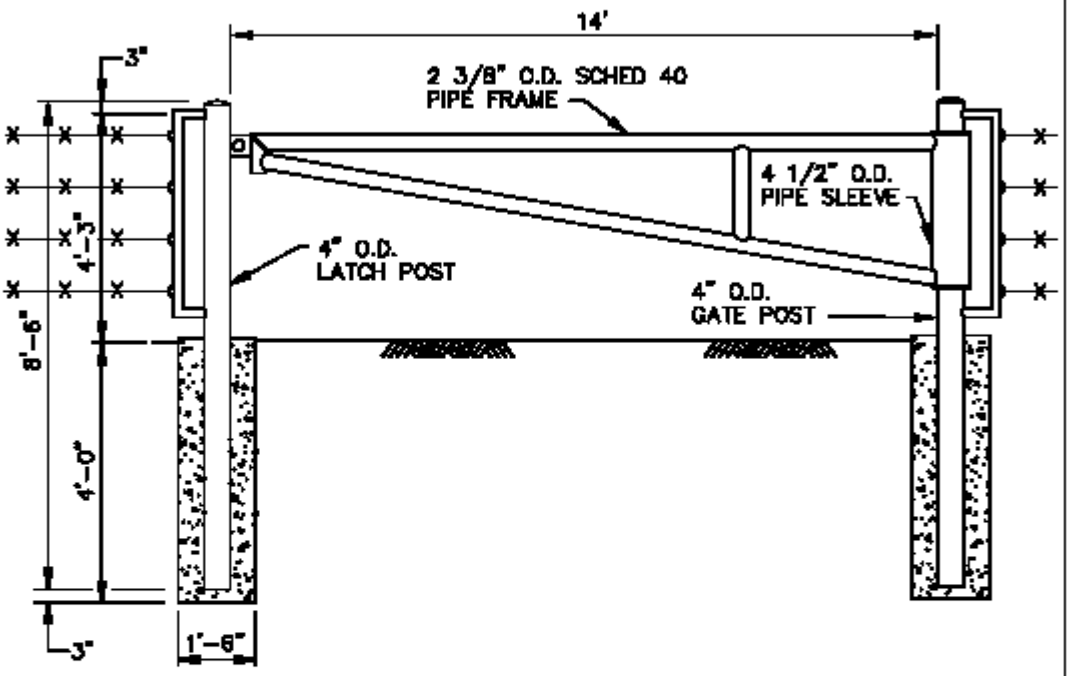
SECTION B–B

NOTE:

THE MAXIMUM WATER DEPTH, BASED ON A 10 YEAR FREQUENCY STORM, SHALL BE 10". THE DEPTH (D) IN FEET MULTIPLIED BY THE VELOCITY (V) IN FEET PER SECOND SHALL BE EQUAL TO SIX OR LESS. (DXV=6)

SDGE

DIP SECTION	DR–2

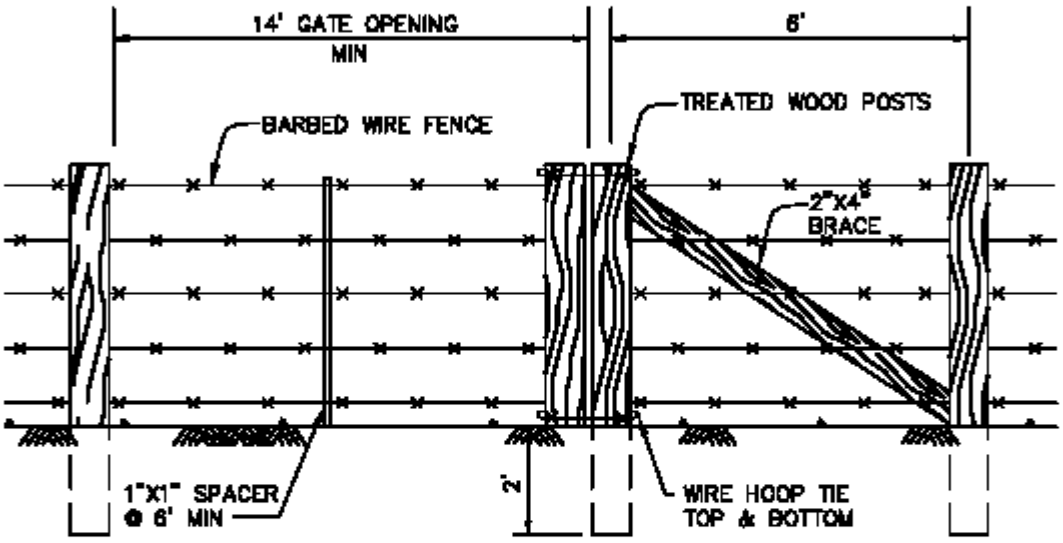


NOTES

1. FOOTINGS SHALL BE MINIMUM 3000 PSI CONCRETE

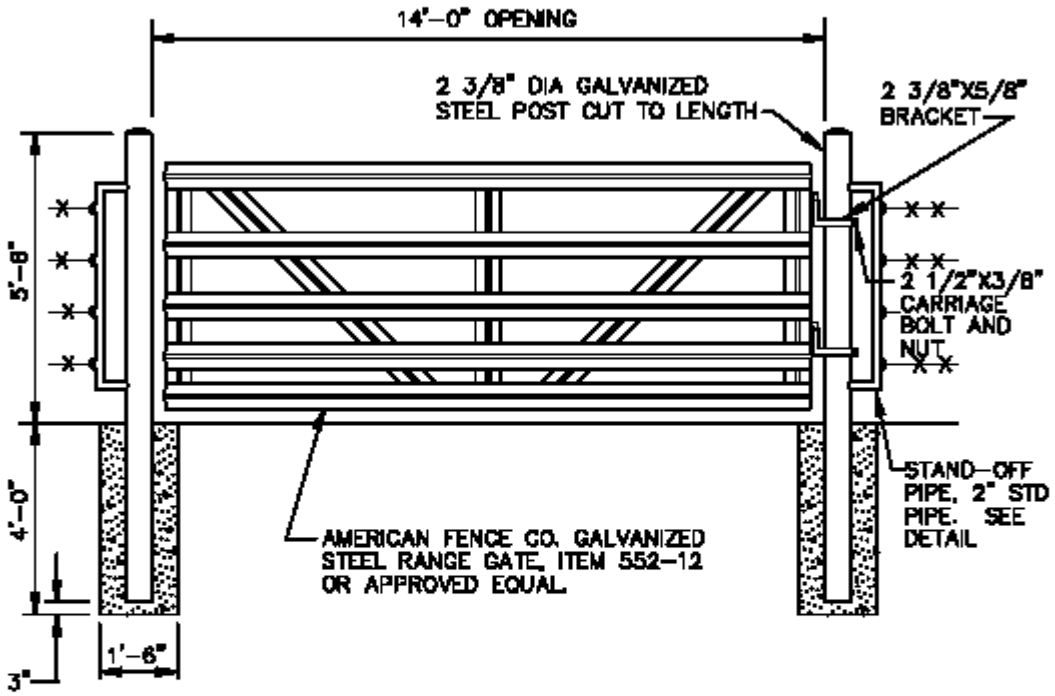
SDGE

PIPE GATE	MS–1



SDGE

BARBED WIRE GATE	MS–2



SDGE

RANGE GATE	MS-3