

## 2.5 Plan Sheet Preparation - Levels Involved

### A. Plan Sheet Preparation

Project plan sheets of the geographical type are prepared by combining various levels from the CADD master drawings. The master drawings consist of the Master Topographic file, Master Design file and Master Border Sheet file (see chapter 3 of this manual). This section provides guidelines on how the various levels are combined to create the required geographical contract plan sheets.

Base maps are created by combining the Master Topographic file and the Master Design file. This generally involves levels 1 thru 8 for the Master Topographic file and levels 13 through 18, 20, 21, and 30 through 32 in a pre-V8 DGN for the Master Design file. In a V8 DGN the levels involved would generally be 13 through 18, 20, 21, and 128 through 137 for the Master Design file.

Base maps are referenced to the Active Design file (contract plan sheet). Base maps should be left as a referenced file for as long as possible. All functional units should use the base map created from the Master Topographic file and the Master Design file. Functional units can control the information displayed from the base maps by turning levels on or off.

Note: If the Caltrans leveling convention is used from the start of a project, the handling of the electronic information becomes very easy for all users and functional units working on the project.

Nongeographical type contract plan sheets are prepared on an individual basis and do not generally involve the use of base maps.

For details regarding individual plan sheet content and requirements, see the Plans Preparation Manual.

B. Highway Design and Topographic Information  
(Alphabetically and Corresponding Level)

Two level numbers indicate the pre-V8 leveling convention and the V8 leveling convention for Right of Way information. One level number indicates that it is for both a pre-V8 and V8 DGN file.

| <b>Level</b> | <b>Element</b>                           |
|--------------|--|
| 24           | AC Resurfacing                           |
| 20           | Approach Slab Details                    |
| 62           | As-built changes                         |
| 22           | Barricades                               |
| 25           | Bikepath Alignments                      |
| 22           | Bridge Structures                        |
| 22           | City Street Islands                      |
| 60           | City Limits                              |
| 5            | Communication Conduit                    |
| 60           | Construction Detail Notes                |
| 60           | Construction Details                     |
| 46           | Construction Signing                     |
| 12           | Construction Staking Survey Control Data |
| 7            | Contours                                 |
| 8            | Contour Annotation                       |
| 41           | Contour Grading                          |
| 1            | Control (Photogrammetry and Survey)      |
| 32/132 *     | Controlled Access – New                  |
| 31/131 *     | Controlled Access - Existing             |
| 60           | County Boundary Lines                    |
| 22           | Crash Cushions                           |
| 25           | Creek Alignment                          |
| 42           | Curb and Gutter Elevations               |
| 21           | Curbs                                    |
| 23           | Curve Alignment Data-Table Format        |
| 30           | Cut and Fill Data                        |
| 51-56        | Detours                                  |
| 60           | Diagrams for Superelevation              |
| 21           | Dike                                     |
| 36           | Ditches                                  |
| 36           | Drainage                                 |
| 36           | Drainage Details                         |
| 37           | Drainage Item Number                     |
| 20           | Driveways                                |
| 21           | Edge Drains                              |
| 47           | Electrical                               |
| 35           | Erosion Control                          |
| 32           | ESA – boundaries and fences              |
| 6            | Existing Drainage Features               |
| 31/128 *     | Existing Easement Lines                  |
| 29           | Existing Irrigation Features             |
| 2            | Existing Man-Made Features               |
| 3            | Existing Roadway Features                |

| <b>Level</b> | <b>Element</b>                              |
|--------------|---|
| 4            | Existing Vegetation/Natural Features        |
| 5            | Existing Utility Features                   |
| 6            | Existing Hydrographic Features              |
| 32           | Fences                                      |
| 17           | Frontage Road Alignment                     |
| 12           | Grid Ticks and Labels                       |
| 45           | Guide Markers                               |
| 21           | Gutters                                     |
| 36           | Grate Details                               |
| 22           | Headlight Glare Screen                      |
| 61           | Headquarter Changes                         |
| 30           | Hinge point                                 |
| 50           | Irrigation - Proposed                       |
| 49           | Landscaping                                 |
| 43           | Lane Lines                                  |
| 47           | Lighting                                    |
| 15           | Mainline Alignment                          |
| 10           | Matchline                                   |
| 22           | Median Barrier                              |
| 22           | Miscellaneous Paved Area                    |
| 60           | Non-geographical Drawing Data               |
| 10           | North Arrow                                 |
| 23           | Notes                                       |
| 24           | Obliteration and AC Resurfacing             |
| 21           | Overside Drains                             |
| 20           | Pavement Edges/Edge of Traveled Way         |
| 42           | Pavement Elevations                         |
| 43           | Pavement Markers                            |
| 43           | Pavement Striping                           |
| 25           | Pedestrian Path Alignments                  |
| 49           | Planting                                    |
| 60           | Profile Grade Information                   |
| 9            | Profile Grid                                |
| 32/134 *     | Proposed Easement Lines                     |
| 60           | Quantity Tables (not specifically assigned) |
| 25           | Railroad Alignment                          |
| 13           | Ramp Alignment                              |
| 7            | Relief Features                             |
| 58           | Retaining Wall Information                  |
| 32/132 *     | Right of Entry - New                        |
| 31/131 *     | Right of Entry - Existing                   |
| 31/131 *     | Right of Way Lines - Existing               |
| 32/132 *     | Right of Way Lines - New                    |
| 38           | Sanitary Sewer                              |
| 39           | Sanitary Sewer Annotation                   |
| 10           | Sheet Format (border)                       |
| 22           | Sidewalks                                   |
| 47           | Signal & Lighting Installations             |
| 63           | Signatures – all registered engineers       |
| 45           | Sign Installation                           |
| 22           | Slope Protection                            |
| 58           | Sound Wall Information                      |

| Level | Element   |
|-------|---|
| 8     | Spot Elevations                                 |
| 29    | Sprinkler Control Conduit – Existing            |
| 50    | Sprinkler Control Conduit - Proposed            |
| 51-56 | Stage Construction                              |
| 60    | Strip Map for Title Sheet                       |
| 60    | Structural Section Number                       |
| 1     | Survey Monuments                                |
| 23    | Symbols (Leader lines, arrows, Arrowheads, etc) |
| 25    | Temporary Alignments                            |
| 25    | Temporary Road Connections and Alignments       |
| 51-56 | Temporary Barriers (k-rail)                     |
| 34    | Temporary Water Pollution Control               |
| 30    | Toe of Slope                                    |
| 49    | Topsoil   |
| 43    | Traffic Arrows                                  |
| 51-56 | Traffic Control (temporary facilities)          |
| 43    | Traffic Letters                                 |
| 51-56 | Traffic Handling Plans                          |
| 43    | Traffic Striping                                |
| 60    | Typical Cross Sections                          |
| 36    | Underdrains                                     |
| 40 ** | Utilities - Proposed                            |
| 40 ** | Utilities – Relocated                           |
| 5 **  | Utilities - Existing                            |
| 50    | Water Supply Line                               |
| 22    | Wheelchair Ramps                                |

\* See Appendix A9 of this manual for the V8 leveling convention for Right of Way.

\*\* See Appendix A9 of this manual for the V8 leveling convention for Utilities.

### C. Levels Involved for Various Plan Sheets (Highway Construction)

The following chart shows the levels generally required to produce the various geographical project plan sheets. Depending on the complexity of the project, certain levels may or may not be needed when creating an individual type of sheet.

The following chart is a “Type of Sheet” / “Information on a Specific Level” cross-reference list. Plan sheet elements are listed on the left, and the information on a specific level is across the top.

**LEVELS FOR PROJECT PLAN SHEETS  
(GEOGRAPHICAL TYPE)**

| INDIVIDUAL PLAN SHEET FUNCTION                  | Control | Exist Man-Made Features | Existing Roadway Features | Existing Vegetation and Natural Features | Existing Utility Features | Existing Hydrographic Features | Relief Features - Contours | Spot Elevations and Contour Annotation | Profile Grid | Border Sheets & Seal Information | Grid | Ramp, Over and Undercrossing Alignment Data | Mainline Alignment Data | Frontage Road Alignment Data | Pavement Edges | Curves, Gutters, and Dikes | Misc. Construction Features | Layout Notes | Obliteration and AC Resurfacing | Temporary Road Connections and Alignments | Existing Irrigation | Cut and Fill Data | Existing Right of Way Boundaries | Right of Way Lines, Easements, ESA's and Fence | Temporary Water Pollution Control | Permanent Erosion Control | Drainage | Sanitary Sewer | Utilities - Includes Annotation | Contour Grading | Pavement Elevations | Pavement Markers and Striping | Signing | Construction Area Signing | Electrical | Planting and Landscaping | New and Proposed Irrigation | Stage 1 Construction (Stage 4, 7, 10,...) | Stage 2 Construction (Stage 5, 8, 11,...) | Stage 3 Construction (Stage 6, 9, 12,...) | Sound Walls / Retaining Walls | Nongeographical Drawing Data | Engineer's Signature |   |   |   |   |   |
|---|---------|-------------------------|---------------------------|--|---------------------------|--------------------------------|----------------------------|--|--------------|----------------------------------|------|---|-------------------------|------------------------------|----------------|----------------------------|-----------------------------|--------------|---------------------------------|---|---------------------|-------------------|----------------------------------|--|-----------------------------------|---------------------------|----------|----------------|---------------------------------|-----------------|---------------------|-------------------------------|---------|---------------------------|------------|--------------------------|-----------------------------|---|---|---|-------------------------------|------------------------------|----------------------|---|---|---|---|---|
|   | 1       | 2                       | 3                         | 4  | 5                         | 6                              | 7                          | 8                                      | 9            | 10                               | 12   | 13  | 15                      | 17                           | 20             | 21                         | 22                          | 23           | 24                              | 25  | 29                  | 30                | 31                               | 32   | 34                                | 35                        | 36       | 38             | 40                              | 41              | 42                  | 43                            | 45      | 46                        | 47         | 49                       | 50                          | 51  | 53  | 55  | 58                            | 60                           | 63                   |   |   |   |   |   |
| Layout or Combination Layout/Profile            | X       | X                       | X                         | X  | X                         | X                              | X                          | X                                      |              | O                                |      | O   | O                       | O                            | O              | O                          | X                           | O            | O                               | X   | X                   | O                 | O                                | O  | X                                 | X                         | X        | X              | X                               | -               | -                   | X                             | X       | X                         | X          | X                        | X                           | X   | X   | -   | -                             | -                            | X                    |   | O |   |   |   |
| Contour Grading                                 | X       | X                       | X                         | X  | X                         | X                              | X                          | O                                      |              | O                                |      | O   | O                       | O                            | O              | X                          | X                           |              |                                 | X   | X                   | O                 | O                                | O  | X                                 | X                         | X        | X              | X                               | O               | X                   | -                             | -       | -                         | -          | -                        | -                           | -   | -   | -   | -                             | -                            | -                    | - |   | O |   |   |
| Drainage  | X       | X                       | X                         | X  | X                         | O                              | X                          |  |              | O                                |      | O   | O                       | O                            | O              | O                          | X                           |              |                                 |   | X                   |                   | O                                | O  | X                                 | X                         | O        | X              | X                               | X               | -                   | -                             | -       | -                         | -          | -                        | -                           | -   | -   | -   | -                             | -                            | -                    | - |   | O |   |   |
| Irrigation                                      | X       | X                       | X                         | X  | X                         | X                              | X                          |  |              | O                                |      | O   | O                       | O                            | O              | O                          | -                           |              |                                 |   | O                   |                   | O                                | O  | X                                 | X                         | O        | X              | X                               | X               | -                   | -                             | -       | -                         | -          | -                        | -                           | X   | O   | -   | -                             | -                            | -                    | - |   | O |   |   |
| Signal and Lighting                             | X       | X                       | X                         | X  | O                         | X                              | X                          |  |              | O                                |      | O   | O                       | O                            | O              | -                          | -                           |              |                                 |   | -                   | -                 | O                                | O  | O                                 | -                         | -        | -              | X                               | X               | -                   | -                             | O       | X                         | X          | O                        | -                           | -   | -   | -   | -                             | -                            | -                    | - |   | O |   |   |
| Pavement Elevation                              | X       | X                       | X                         | X  | X                         | X                              | X                          |  |              | O                                |      | O   | O                       | O                            | O              | -                          | -                           |              |                                 |   | -                   | -                 | -                                | -  | -                                 | -                         | -        | -              | X                               | X               | -                   | O                             | -       | -                         | -          | X                        | -                           | -   | -   | -   | -                             | -                            | -                    | - |   | O |   |   |
| Pavement Markers & Striping                     | X       | X                       | X                         | X  | X                         | X                              | X                          |  |              | O                                |      | O   | O                       | O                            | O              | -                          | -                           |              |                                 |   | -                   |                   | X                                | X  | -                                 | -                         | -        | X              | X                               | -               | -                   | O                             | O       | O                         | X          | -                        | -                           | -   | -   | -   | -                             | -                            | -                    | - | - |   | O |   |
| Planting & Landscaping                          | X       | X                       | X                         | X  | X                         | X                              | X                          |  |              | O                                |      | O   | O                       | O                            | O              | -                          | -                           |              |                                 |   | X                   |                   | O                                | O  | -                                 | X                         | O        | X              | X                               | X               | -                   | -                             | -       | -                         | -          | -                        | O                           | X   | -   | -   | -                             | -                            | -                    | - | - |   | O |   |
| Temp Water Pollution & Erosion Control          | X       | X                       | X                         | X  | X                         | X                              | X                          |  |              | O                                |      | O   | O                       | O                            | O              | -                          | -                           |              |                                 |   | -                   | -                 | X                                | X  | O                                 | O                         | X        | X              | X                               | X               | -                   | -                             | -       | -                         | -          | -                        | -                           | X   | X   | -   | -                             | -                            | -                    | - | - |   | O |   |
| Sanitary Sewer                                  | X       | X                       | X                         | X  | X                         | X                              | X                          |  |              | O                                |      | O   | O                       | O                            | O              | -                          | -                           |              |                                 |   | -                   | -                 | O                                | O  | -                                 | -                         | X        | O              | X                               | -               | X                   | -                             | -       | -                         | -          | X                        | -                           | -   | -   | -   | -                             | -                            | -                    | - | - |   | O |   |
| Signing   | X       | X                       | X                         | X  | X                         | X                              | X                          |  |              | O                                |      | O   | O                       | O                            | O              | -                          | -                           |              |                                 |   | -                   |                   | X                                | X  | -                                 | -                         | X        | X              | X                               | -               | -                   | O                             | O       | O                         | X          | X                        | X                           | -   | -   | -   | -                             | -                            | -                    | - | - | - |   | O |
| Stage Construction and Traf. Handling & Detours | X       | O                       | X                         | X  | X                         | X                              | X                          |  |              | O                                |      | X   | X                       | X                            | X              | X                          | X                           |              |                                 | O   |                     |                   | O                                | O  | -                                 | -                         | X        | X              | X                               | -               | -                   |                               | X       | X                         | X          | X                        | -                           | -   | -   | -   | -                             | O                            | O                    | O | - |   | O |   |
| Sound & Retaining Walls                         | X       | X                       | X                         | X  | X                         | X                              | X                          |  |              | O                                |      | X   | X                       | X                            | X              | X                          | -                           |              |                                 |   |                     |                   | X                                | X  | -                                 | -                         | X        | X              | X                               | -               | X                   | -                             | -       | -                         | -          | -                        | -                           | -   | -   | -   | -                             | -                            | -                    | - | O |   | O |   |
| Utilities                                       | X       | X                       | X                         | X  | O                         | X                              | X                          |  |              | O                                |      | O   | O                       | O                            | O              | X                          | X                           |              |                                 |   | X                   |                   | O                                | O  | -                                 | -                         | X        | X              | O                               | -               | -                   | -                             | -       | -                         | -          | X                        | -                           | -   | -   | -   | -                             | -                            | -                    | - | O |   | O |   |
| Typical Cross Section & Details                 |         |                         |                           |  |                           |                                |                            |  |              | O                                |      |   |                         |                              |                |                            |                             |              |                                 |   |                     |                   |                                  |  |                                   |                           |          |                |                                 |                 |                     |                               |         |                           |            |                          |                             |   |   |   |                               |                              |                      |   | O |   | O |   |
| Standard Sheet Format                           |         |                         |                           |  |                           |                                |                            |  | X            | O                                |      |   |                         |                              |                |                            |                             |              |                                 |   |                     |                   |                                  |  |                                   |                           |          |                |                                 |                 |                     |                               |         |                           |            |                          |                             |   |   |   |                               |                              |                      |   | O |   | O |   |

**LEGEND**  
 O - Required  
 X - Optional  
 - - Normally not needed  
 Blank = N/A

**NOTES:** Annotation levels are not shown on this table.

See Appendix A9 for reassigned or expanded levels for Right of Way or Utilities information.