

RED-LINE and AS-BUILT PROCEDURE AND GUIDELINES

The As-Built procedure described below shall be applied by staff and consultants to all projects which involve ADOT oversight to assure ADOT and other stakeholders the deliverance and availability of the As-Built information. As-Built Plans are required on all projects including but not limited to: permit projects, procurement projects, sub-program projects, Transportation Enhancement projects and Local Government projects.

If a project crosses or impacts property owned or maintained by the Central Arizona Water Conservation District (CAWCD), Maricopa Water District (MWD), refer to the Contract Special Provisions.

As-Bid Plans:

The As-Bid Plan Set is the final sealed and signed plans including addendums at bid opening.

Field Red-Line Plans:

The Field Red-Line Plans record the changes that have occurred during construction and are incorporated onto the plans manually and/or electronically prepared by the Construction Administrator. The field Red-Line set and other miscellaneous documents will be provided by the Construction Administrator for the preparation of the As-Built plans.

As-Built Plans:

As-Built Plans are the official record drawing that documents what was constructed. Please refer to ARS32-152 for the official definition.

As-Built Designer:

Is a person in charge of the As-Built Plans for a project who ensures that the Field Red-Line Plans are transferred accurately to the As-Built Plans.

Construction Administrator:

Is the ADOT Resident Engineer or the person who is in charge of administrating the project.

Designer of Record:

Is the professional registrant who is responsible for sealing the plan sheet.

Purpose

The purpose of these guidelines and procedures is to ensure that the As-Built Drawings are created consistently and accurately for all projects.

PROCEDURE

1. The Construction Administrator ensures that all project changes to the As-Bid Plans have been recorded on the Field Red-Line Plans. Use the “Field Red-Lines Construction Inspection Quantlist” (Attachment #1) and the Red-Line Guidelines section of this document.
2. The Construction Administrator completes the Field Red-Line information on the cover sheet (Attachment #2) and coordinates with the ADOT project manager for the delivery of the complete Red-Line package to the As-Built Designer in charge of the project.
3. The As-Built Designer will review the Field Red-Line Plans for legibility and accuracy. During the review process, the As-Built Designer and Construction Administrator must address any discrepancies, resolve any concerns, and establish a schedule for completion of the As-Built Plans. The As-Built set will be completed in a maximum of 60 days from the date the Field Red-Line Plans are received by the As-Built Designer. When the Construction Administrator has confirmation that the As-Built Designer has received the Field Red-Line Plans, they will send an email to Field Reports indicating the date the As-Built Designer received the documents. That email will trigger an entry into the FAST system that will be used to document the completion deadline.
4. The Construction Administrator and the As-Built Designer will consult to determine what process will be used to create the As-Built plans and will inform the project manager of the decision. With all processes the As-Built plans will be created by following the As-Built Guideline section of this document. They can choose one or a combination of the following processes:
 - **Process One** – If the final Field Red-Line Plans are a hand written hard copy and are clean, complete and legible they can be converted to As-Built plans. The document will then be scanned to PDF by the As-Built Designer unless the Construction Administrator chooses to do so.
 - **Process Two** – If the Field Red-Line sheets are in PDF format, red lined electronically, and are clean, complete and legible they can be converted to the As-Built plans by the As-Built Designer unless the Construction Administrator chooses to do so.
 - **Process Three** – The As-Built Designer transcribes all of the Red-Lines electronically onto the plans using the TIFF or PDF file that has been imported into Microstation or Adobe Professional and prepares the As-Built plans.
5. Once the Red-Lines are converted into the As-Built set, the As-Built Designer will return to the Construction Administrator, an electronic copy (PDF) and at the request of the Construction Administrator one (1) hard copy set of half size As-Built plans. The Construction Administrator will complete the final review.

6. The Construction Administrator will notify the ADOT project manager and the As-Built Designer via email that the As-Built plans are complete and approved. They will also send or request that the As-Built Designer send: one (1) hard copy half size set (11" x 17") of As-Built plans and a CD/DVD in PDF format of the As-Built plans to the Statewide Project Management Transportation Engineering Specialist (SWPMTES). The As-Built Designer will notify the Construction Administrator & PM when the plans have been sent to the SWPMTES.
7. The SWPMTES will check that all pages are printed and ensure that the files do not contain un-readable or corrupt file(s) and then will load them into the AIDW. If the As-Built deliverables contain corrupt or unreadable file(s), the SWPMTES will notify the As-Built Designer, project manager and Construction Administrator of the discrepancy and request the delivery of a new file. When the As-Built Plans are checked into the AIDW it will trigger an entry into FAST that will enter the As-Built submittal date and send email notifications to the Construction Administrator & PM. Until this trigger can be put into play the SWPMTES will send notice to Field Reports that he/she has received the As-Built Plans.
8. The SWPMTES will send the As-Built set to Engineering Records and send an email to the Construction Administrator, the As-Built Designer and the project manager stating that the As-Built Plans have been delivered.

Red-Line Guidelines

1. The base for Red-Lines will be a copy of the As-Bid Plans.
2. Complete the applicable Red-Line information on the cover sheet (see example Attachment #2).
3. Ensure that every sheet has been sealed and signed by the Engineer of Record.
4. All field revisions to permanent construction will be documented. These revisions include but are not limited to geometric, utilities, underground, guardrail, striping, signage and permanent erosion control.
5. Shop drawings that are unique in nature and are original contractor submitted designs that were not included in the as bid plans, shop drawings that change the design, RFI's and Supplemental Agreements will all be documented. Any additional shop drawing plan sheets will be added at the end of the plan set.
6. Minor Revisions will be drawn on the original sheets.
 - o The Construction Administrator may add sketches that clarify or document new findings or field modifications that need to be recorded.
 - o Construction Administrator should ensure that the Red-Line Plans are readable, without leaving any extraneous data on the plans.
 - o Use red to record your changes. Changes may be clouded at this point if the Construction Administrator chooses to.

7. Major Revisions:

- o If a revised sheet is needed the new sheet shall be sealed and signed by the Designer of Record (PE) making the revision.
- o The original As-Bid sheet is not discarded. An “X” must be drawn from corner to corner of the borders.
- o The line should not be so wide as to obscure any details that should remain visible.
- o The revised sheet is numbered with the same sheet number and includes a revision line with the Revision Number, description, date and initials of the person doing the changes.
- o If a single sheet is being revised several times, an “X” must be drawn on the original sheet and subsequent sheets until the last revised sheet has been submitted. Place the sheets behind the original in chronological order, numbering them using the original sheet number and the Revision Number.
- o The construction field office may Red-Line changes onto the plans. If there were multiple revisions for a single sheet, all revisions should be transferred onto the last revision sheet.
- o If there is no time to prepare an electronic detail, hand drawn sketches sealed and signed by the Professional Registrant responsible for the change may be used. These types of details should be converted to a formal revision to the plans prior to the completion of the construction. (See Attachment #3 and #4).
- o All revisions prepared by the designer will be clouded and if necessary numbered using the triangles legend.

8. Added Plan Sheets:

- o Added plan sheets shall be inserted within the appropriate section. Label the sheet with the sheet number and the next letter in the alpha designation sequence using upper case alpha letters (“18A”, “18B”, etc) in the upper right title block.

As-Built Guidelines

- 1.** The prime consultant or technical group that is the lead for design is also the lead for distributing the Red-Line Plans and compiling the As-Built documents.
- 2.** Complete the As-Built information on the cover sheet (see example Attachment #2)
- 3.** All changes need to be legible. Where drafting of changes is required the As-Built Designer is responsible for producing quality drawings from the Red-Lines provided.
- 4.** All revisions will be clouded. Never remove old values or details, just line or “X” through them. If there is no room for the new value, you can go to the side on the same line or beneath the table and state that value X is being replaced by Y.
- 5.** If sheets are revised, only the original as bid sheet with the X across it and the final revision sheet showing all revisions will be included in the As-Built.
- 6.** Ensure that every sheet has been sealed and signed by the Engineer of Record.
- 7.** The person preparing the As-Built drawings must date every sheet in the upper right hand corner whether or not there are changes in that plan sheet.
- 8.** When the set is complete the sheets are to be numbered consecutively in the lower right corner of the title block

ARIZONA DEPARTMENT OF TRANSPORTATION
 INTERMODAL TRANSPORTATION DIVISION

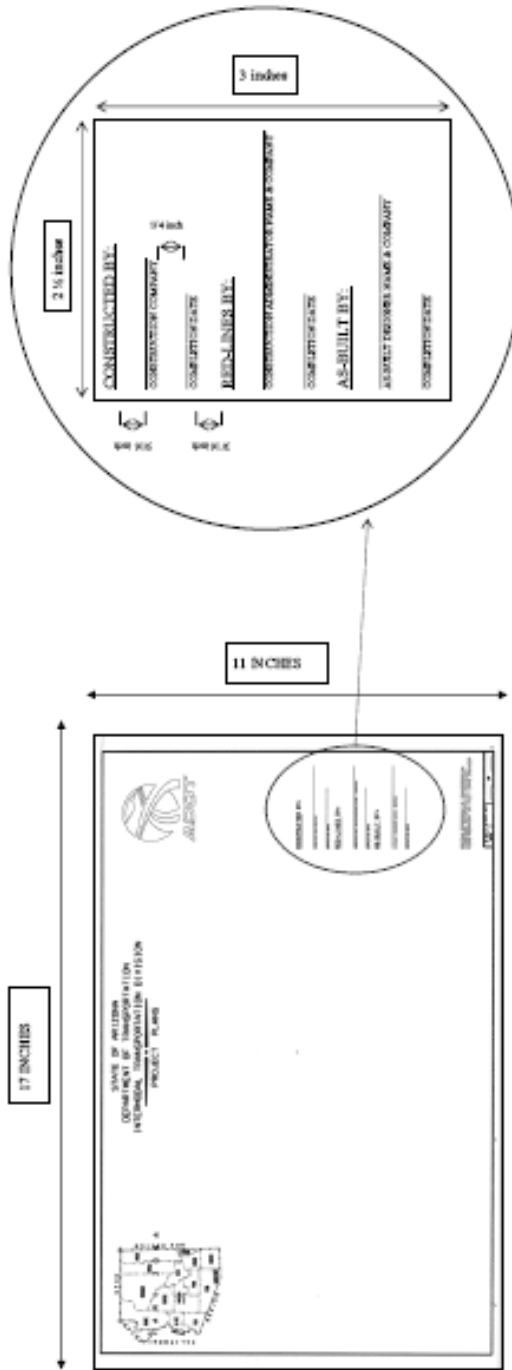
Construction Inspection Quantlist
General Provisions Division 1 Field Red-Lines

Version: 12072009

Project Number:		Tracs Number:	
Reviewer:		Contractor:	
Begin Date:		Completion Date:	
Bid \$ Amount:		Final \$ Amount:	

Conforming?	Attributes
Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	1. All Field Red-Lined changes are recorded onto a hardcopy (Half or Full size) or electronic image of the Original As-Bid plans.
	Comment:
Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	2. Field Red-Line submittal set includes all As-Bid plan sheets, addendums, shop drawings (only if unique in nature) and any redesigned plan sheet (submitted by any Professional) including the properly "Xed" out original sheets.
	Comment:
Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	3. Field Red-Line information is complete and includes location, (stationing, elevations, offsets etc.), dimensions, and item name.
	Comment:
Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	4. Field Red-Lines include all plan's modifications whether by field adjustments, supplemental agreements or RFIs and findings that differ from the conditions shown on the as-bid plans.
	Comment:
Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	5. Field Red lines include all utility work (gas, water, CAP, electric, communications, irrigation, railroad, etc.) moved, added or abandoned as part of the construction project.
	Comment:
Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	6. Field Red-Lines include only information relevant to the modifications. (Insure inspector's field notes are not included.)
	Comment:
Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	7. Field Red-Lines are legible; drawings and text are done neatly and print size is adequate.
	Comment:

Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	8. Supplemental pages containing plan modification sketches have been sealed and signed by the registrant author of those sketches (ae. Designer, RE or contractor's registrant who is providing the sketches).
	Comment:
Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	9. Field Red-Lines have been checked for accuracy prior to submittal to the As-Built designer.
	Comment:
Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	10. Field Red-Lines ready for submittal is a complete set and are in a correct sequential order.
	Comment:
Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	11. The Construction Administrator has completed the Field Red-Lines Information on the front page of the Red-line set.
	Comment:
Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	12. Construction Administrator submits Field Red-Lines to As-Built designer (including Consultant, internal ADOT & Local Government administered projects) within 45 days of project final acceptance. (cc submittals to PM)
	Comments:



PART B: As-Built Block Information

PART A: Typical Half-Size plan sheet example

NOTE

The As-Built block and/or page can be found at ADOT Roadway Group's website: https://www.adot.gov/highway/roadway_engineering/roadway_design/CAAD/Resources/Index.asp. Under "facsheet.ref" which is a Micro-station DGN file. For anyone unable to access the file, the following information should be taken as recommended dimensions and sizes to be used to create the block and information required on the front sheet of the As-Built plans.

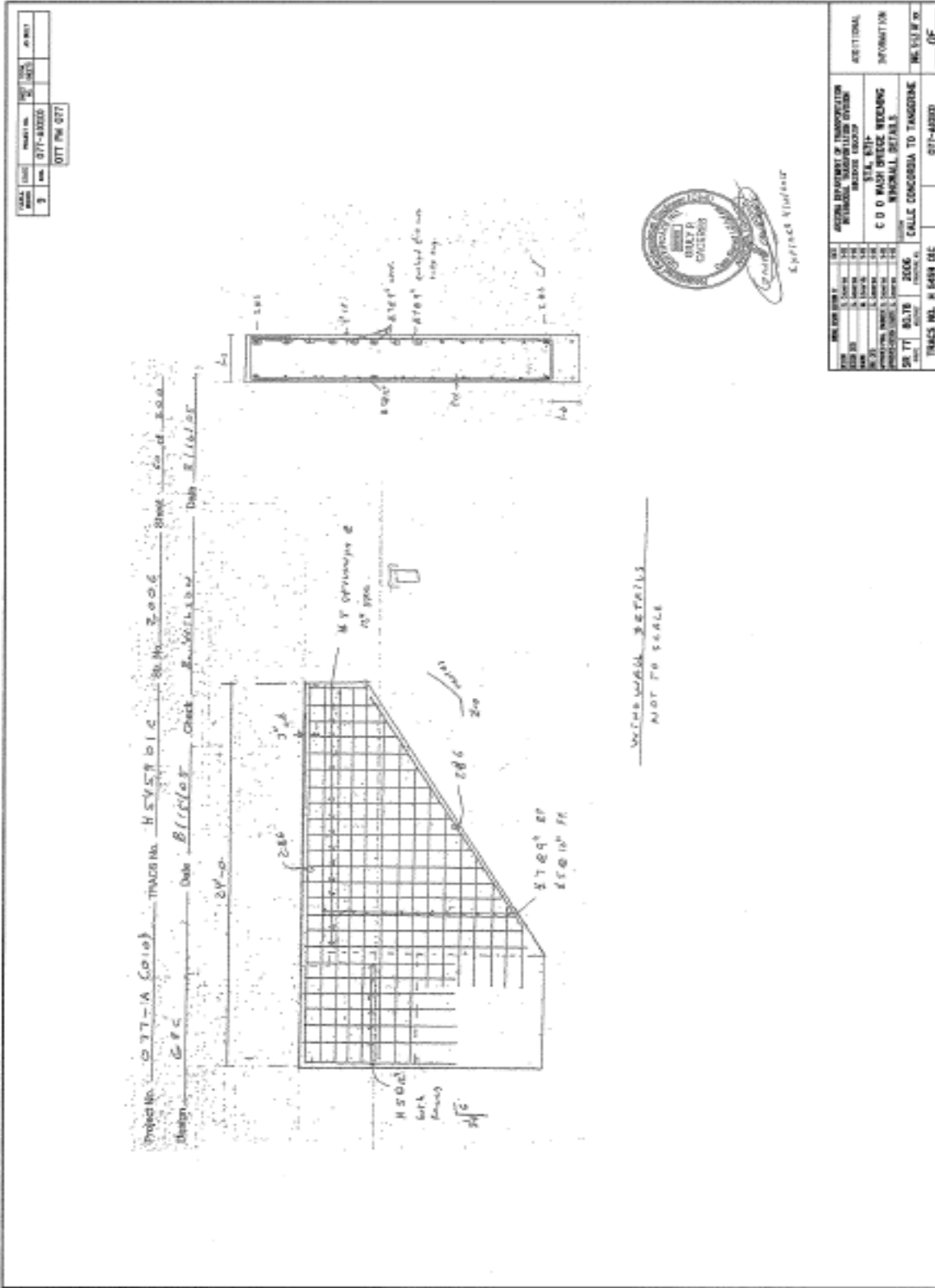
Dimensions shown in part B are in reference to a half size (11 by 17 inch) plan sheet as shown. Adjustments will be necessary for full size plans and if using PDF professional.

Block 2 1/4 inches wide by 3 inches high

FONT SIZES

"CONSTRUCTED BY," Times Roman 11 or similar

"COMPLETION DATE," Times Roman 7 or similar



Arizona Department of Transportation
As-Built Preparation Estimate

Project Number:

Resident Engineer's name:

TRACS No.

Date:

Enter your data in all yellow fields DO NOT CHANGE THESE FIELDS	Unit	Number of sets	Estimated minutes / sheet	Total estimated time	Total estimated time
				minutes	Hours

Number of sheets in plan set	573	sheets				
Number of sheets with no revisions (no redlines) including check of seal and signature (1 min/sheet)	300	sheets	1	1.00	300	5
(*) Number of sheets with limited revisions (minor edit redline changes) (15 min/sheet).	200	sheets	1	15.00	3000	50
(*) Number of sheets with extensive revisions (some drawings need to be either created or edited) (40 min/sheet)	73	sheets	1	40.00	2920	49
Number of extra sheets to confirm that all pages are signed (1 min/sheet)	273	sheets	1	1.00	273	5
print half-size sets (1 check, 1 final) (10 sec/sheet)	573	sheets	2	0.17	191	3
scan and copy set for CD (2 min/sheet .pdf)	573	sheets	2	2.00	2292	38
Administration (contract estimate, QC etc)						16
Check number of pages against breakdown of changes ok	Total Project Hours =				166	
	Equivalent to (min/sheet) =				17	

(*) Note: Some major changes may need more time to re-draw some details. If that is the situation in your project then add 5 to 10% total hours or consult with the As-Built Statewide Project Management Specialist

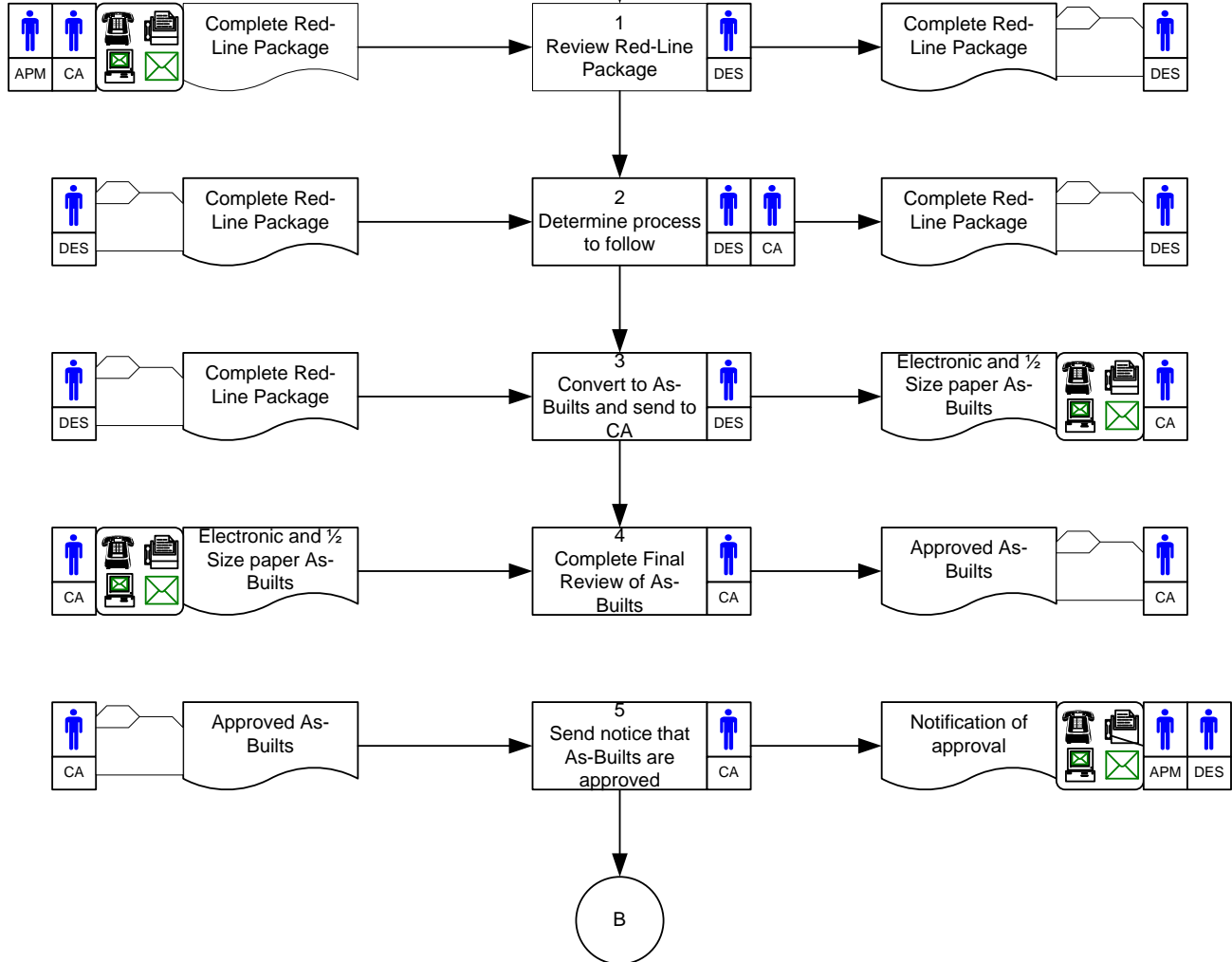
Input

Activity

Output

Complete Red Line Package

* Completed Red-Line Plans with the Field Red-Line information completed on the cover sheet



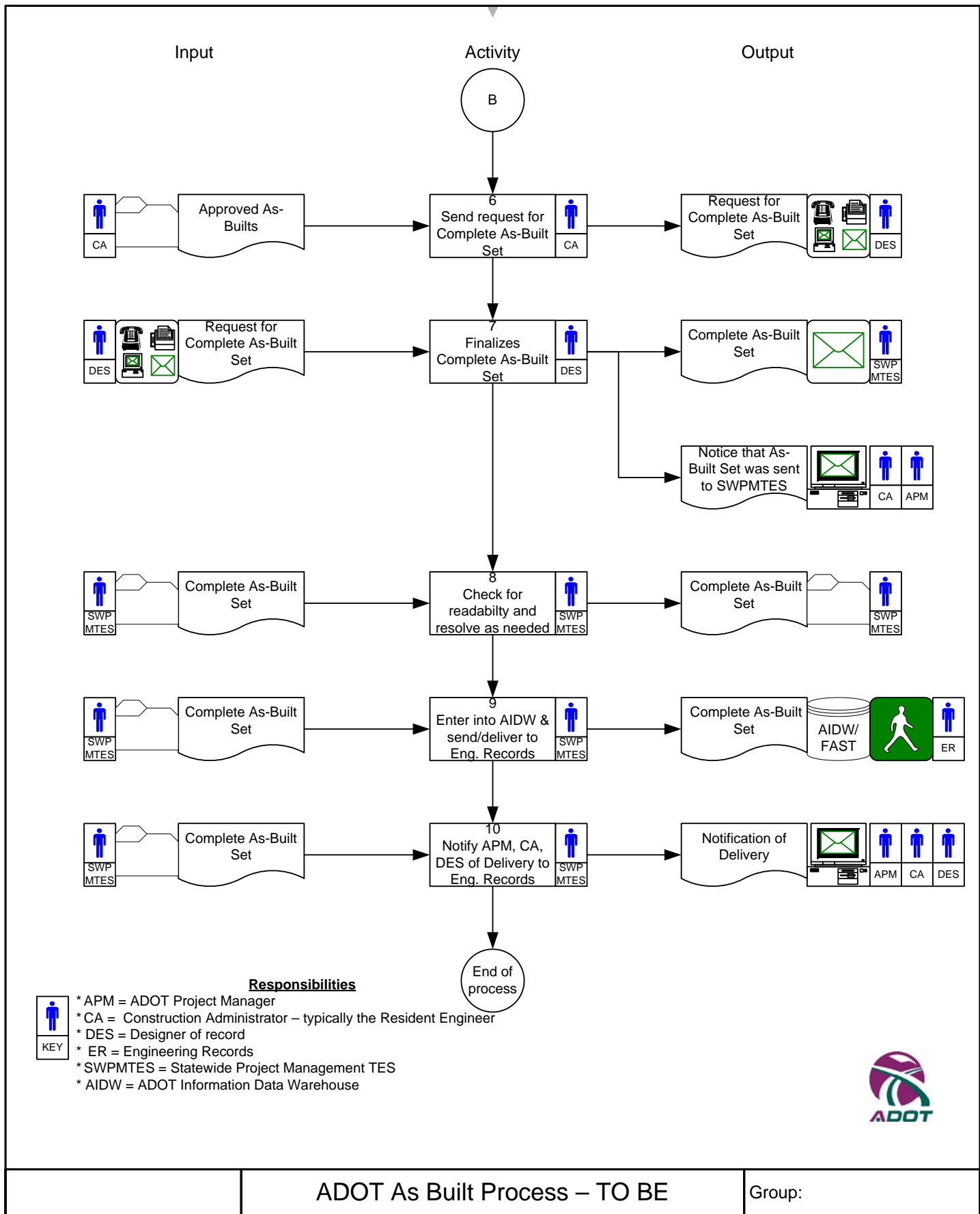
Responsibilities

- * APM = ADOT Project Manager
- * CA = Construction Administrator – typically the Resident Engineer
- * DES = Designer of record
- * ER = Engineering Records
- * SWPMTES = Statewide Project Management TES
- * AIDW = ADOT Information Data Warehouse



ADOT As Built Process – TO BE

Group:



ADOT As Built Process – TO BE

Group: