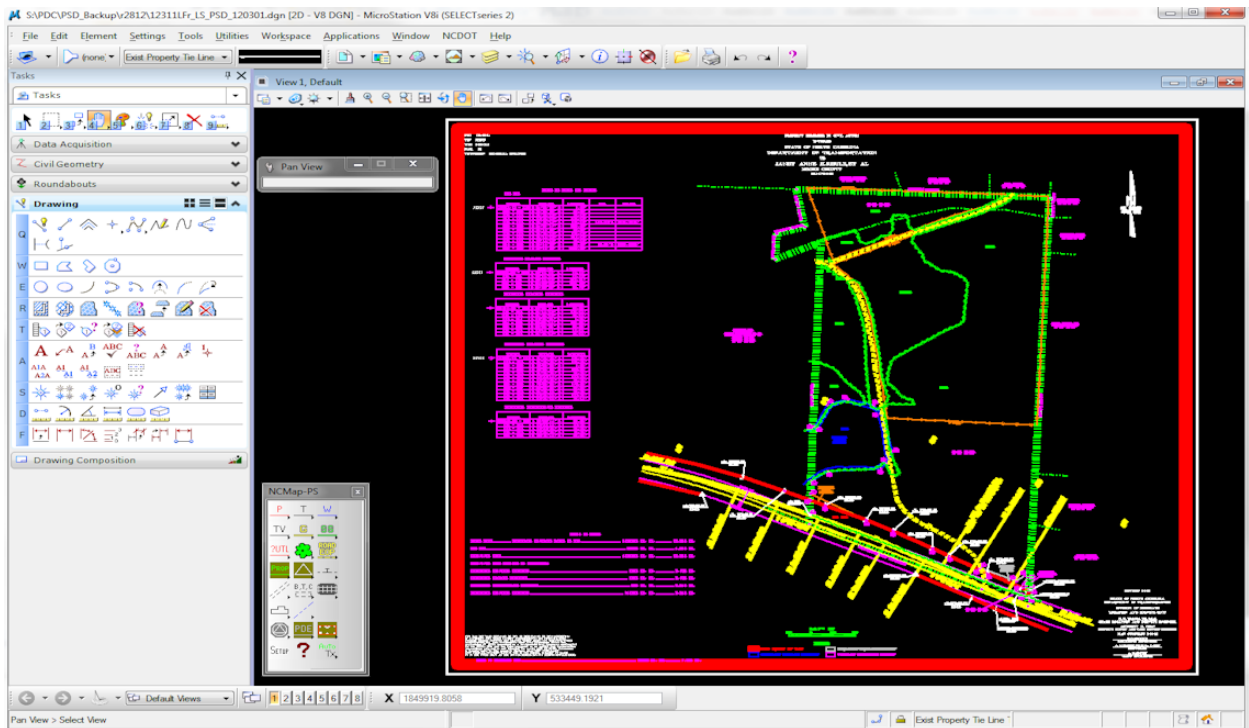


# NCDOT LOCATION AND SURVEYS UNIT PROPERTY SURVEY MANUAL



REVISED MAY 4, 1999

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REVISED OCTOBER 14, 2014

*Before we get started, let's give a brief description on how a road is built and where we fall in the process.*

### ***Planning***

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The Transportation Planning Branch (TPB) provides technical assistance to Metropolitan Planning Organizations (MPOs), small urban areas and counties across North Carolina in the development of Comprehensive Transportation Plans (CTP). The CTP is a 20-25 year plan that is based on future land use, employment and population changes in an area. As part of the development of the plan, an environmental screening takes place to ensure that the plan considers important environmental resources. The final plan includes short term and long term recommendations for improvements to the overall transportation system.

The CTP is mutually adopted by the MPOs or local governments (if not in an MPO) and the North Carolina Department of Transportation and becomes the blueprint for which transportation infrastructure improvements are made in an area.

The transportation needs identified through the development of the CTP are prioritized by either the MPOs or the Rural Planning Organizations (RPOs) and presented to the NC Board of Transportation for programming during the biennial update of the State's Transportation Improvement Program (STIP).

### ***Programming***

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Based on technical information, priorities from MPOs, RPOs and local governments, and public input, the North Carolina Board of Transportation biennially updates North Carolina's 10 year State Transportation Improvement Program (STIP).

### ***Project Development and Environmental Analysis***

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Before any road construction can begin, the Project Development and Environmental Analysis Branch (PDEA) is responsible for the development and preparation of planning and environmental impact studies for all highway projects in the TIP.

The PDEA staff evaluates proposed highway projects according to established engineering practices and guidelines set forth by federal and state laws and regulations. The process includes specialized environmental studies and coordination with the environmental regulatory agencies to ensure appropriate consideration is given to environmental matters. Specialists in such fields as noise and air quality, archaeology, architectural history, biology, land-use planning and sociology provide evaluations regarding the environmental impacts of proposed highway projects. The planning process also involves design and traffic engineering studies, which provide an analysis of highway alternatives to safely, efficiently and economically meet future travel demands.

Citizens are encouraged to participate in the planning process by attending informational workshops, held to obtain public comment and input on proposed highway projects. Comments from citizens are a very important

part of the planning process. Citizens' input is evaluated and addressed during the development of highway improvements.

### *Design*

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Information collected during the planning process is used to determine the location and type of proposed highway to be constructed. In many instances, several alternatives will be studied. On the basis of citizens' input through public meetings, input from coordination with environmental agencies, and the use of available aerial photography mapping to obtain reliable information on the existing physical area and the environment, planners and designers select a highway location.

Design engineers prepare detailed plans for the highway within the selected location. These plans define the type of highway cross-section, two-lane or multi-lane; the width of right-of-way required; the type of intersections and interchanges; bridges; culverts and other drainage features.

Also, plans identify the type of materials to be used and estimate the quantity of each required to construct the highway. These technical plans allow preparation of contract documents and advertisements for contractors wishing to place bids. The successful low-bid is presented to the Board of Transportation for award; the contractor must meet the criteria specified by the Department.

### *Right-of-Way*

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Right-of-way is the process where the NCDOT obtains necessary lands for the construction and improvement of highway projects. This is the last major activity to occur between the completion of design for highway projects and the release of the project to bidders for construction.

In many cases, it is inevitable that a certain amount of private property must be acquired. The displacement of homes and businesses is minimized to the extent practicable. In the acquisition of right-of-way, the NCDOT must treat all property owners with impartiality, fully explain all legal rights, pay just compensation in exchange for property rights, furnish relocation assistance and initiate legal action should a settlement not be reached.

***DURING THIS PHASE IS WHEN OUR MAPS ARE PREPARED***

### *Construction*

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Once the road design is complete, bids are received for construction on the identified date and are publicly disclosed. The contract is awarded by the Board of Transportation to the lowest responsible bidder. The bidder

(private contractor) is then obligated to construct the project in accordance with plan requirements and specifications upon which the bid was received.

NCDOT staff in the Division of Highways administer the contract and provide inspection and testing functions to assure the project is properly constructed. A NCDOT resident engineer and his/her staff will interpret plan details and contract requirements, test for quality, check for conformity with contractual requirements and document the quantity of work performed so the contractor can be paid on a monthly basis. The resident engineer and staff also make certain the environment is protected, manage traffic flow along the project, work with adjacent property owners, observe work zone safety and work with state and federal agencies.

Once the project is complete, a final inspection is made by an engineer not involved in the project's construction to verify its proper construction. The highway is then opened to public traffic.

### Transportation Program Life Cycle



## *Property Surveys*

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Property surveys, in the context used in this manual are maps prepared to accurately illustrate the boundaries of property affected by North Carolina Department of Transportation projects and the areas of right of way, easements and mitigation sites to be acquired by NCDOT from these properties. These surveys may be prepared by the Location and Surveys Unit or by private Engineering firms under contract to the Location and Surveys Unit. These surveys serve several purposes.

Most importantly, they serve to satisfy NCDOT's obligation to prepare a map of property to be acquired by condemnation as described in N. C. General Statute 136-106. This statute states that: "The Department of Transportation, within 90 days from the receipt of the answer shall file in the cause a plat of the land taken and such additional area as may be necessary to properly determine the damages, and a copy thereof shall be mailed to the parties or their attorney; provided, however the Department of transportation shall not be required to file a map or plat in less than six months from the date of the filing of the complaint."

Frequently right of way agents and DOT Attorneys use property survey maps in negotiations and mediations. These activities often result in condemnation cases being resolved without resorting to a costly and time consuming court trial.

Usually property not involved in the condemnation process is acquired for right of way using a description written from the project plans by a right of way agent. When a more accurate metes and bounds description and a more accurate area of the taking is needed a property survey is prepared.

Persons assigned to prepare property surveys should be competent land surveyors. They should be familiar with proper surveying and mapping procedures and practices according to the guidelines set forth in this manual and the Standards of Practice as published by the North Carolina Board of Examiners for Engineers and Land Surveyors however; Property Surveys prepared by the NCDOT Location and Surveys Unit are not intended to meet all of the requirements of NC General Statute 47-30 as amended or 21 NCAC 56.

This manual is provided as a guideline for using information provided by the Attorney General's Office, deed research and information gathered by an actual field survey to produce a quality property survey map.

### *File For Legal Action (Eleven Months Survey)*

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This file is received from the Department of Justice, State Highway Division. Its contents consist of four parts as follows:

1. Cover sheet and authorization for survey.

a. Date, which is approximately the date on which the Civil Action was filed in the Superior Court of the county in which the property is located. The survey and final map are required within eleven months of this date.

b. Name or names of defendants.

c. Project number.

d. County in which Civil Action has been filed.

e. Parcel Number

f. Name of trial attorney assigned to the case.

g. Legal file number.

2. Copies of documents filed in Civil Action in the Superior Court of the county in which the property is located. These papers consist of three parts as follows:

a. Complaint, Declaration of Taking, and Notice of Deposit.

b. Exhibit "A". Pay particular attention to the easements listed on this sheet under the heading of "Liens and Encumbrances". It is required that an easement of right of way be shown on the map of survey.

c. Exhibit "B". Pay particular attention to deeds listed on this sheet under the heading of "Description of Property Affected." The deed books and pages listed should be checked against those shown in the preliminary certificate for correctness and completeness. Also pay close attention to "Interest or Estate Taken". Map should show all easements listed. If there are more easements on the property than listed please contact the attorney (Make sure you document this and put hard copy of this in your folder).

3. Copies of Preliminary Certificates of Title

The description or descriptions shown in the Preliminary Certificate of Title should be checked in the Public Records of the particular county for errors or omissions. When only the deed book and page of the property or properties, exception or exceptions are given, the deed in its entirety, including signature pages, should be copied and inserted in the file. When a plat is available, a legible map (*may*

*need to print a full or half size to achieve this*) should be obtained and inserted in the file. At times deed descriptions or plats of adjoining property are useful in making the survey and copies should be obtained and inserted in the file.

#### 4. Sketch Map

The sketch map is usually a copy of a portion of a Construction Plan Sheet which shows the proposed right of way of the highway, proposed easements, the owner's name and the parcel number. Green colored shaded areas on the map indicate the area required for proposed right of way. Other shaded areas indicate areas required for easements. This map is to be used only as a guide by the surveyor. Final Construction Plan sheets should be used for information required to make the survey. Final construction plans may reflect later revisions to the right of way and/or easements. Final construction plan sheets should have a letting date on the cover sheet. Final construction plan sheets are signed and sealed by the Highway Design Engineer and the Hydraulics Engineer. If final construction plans are not available the most recent stage of preliminary plan should be used. The appropriate right of way agent and resident engineer should be consulted to verify all rights of way and easements on the plans used.

#### *Information Available for Use in Making the Survey*

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A folder, containing the file for legal action, is sent to the field office for survey. Along with it may go special instructions pertaining to the survey. A Property Survey Division (PSD) job number is assigned to each file, and all of the above papers are bound into the right side of the folder. Property Survey Division checklists are bound into the left side of the folder. One checklist is placed in the folder for the aid of the surveyor. Another checklist is placed in the file for use by the CADD technician. Using the checklist is a must and will help produce a complete survey map for the property involved with no omissions of minor details. All of the contents of the folder should be read and thoroughly understood by the surveyor, particularly the description of the property involved and the declaration of taking. Other information, which may be helpful for use in making the survey, may consist of aerial photographs, property strip maps and deed descriptions, and previous condemnation surveys of the property.

The local Right of Way Agent involved in the particular survey can be an invaluable source of information. The Right of Way Agent should always be contacted before beginning work on the survey. He/she can provide an abstract of the existing right of way. Often Right of Way Agents have up to date knowledge concerning recent plan revisions or upcoming plan revisions. If a condemnation case is settled or is going to be settled often the Right of Way Agent knows before the Attorney General's office. If the Right of Way Agent indicates that a case has been settled be sure to contact the Property Surveys Engineer before continuing your work - preparing the map may not be necessary.

The Resident Engineer's office is another valuable source of information. Slope Stake information may be available from the Resident Engineer. He/she may also be aware of recent or upcoming plan revisions. Any documents you receive (R/W abstract, etc.), secure them on the left side of the project folder.

### *The Z Job*

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When the property owner files an answer to the Civil Action, another cover sheet or authorization is issued to the Location & Surveys Unit by the Legal Department. This is a request for a final map of the property in question. The date near the bottom of this sheet is the date when the final map is required to be in the hands of the DOT Attorney. This date is usually about ninety (90) calendar days after the filing of the answer.

If the survey has not been completed as an eleven month survey, it should be completed as soon as possible after the receipt of the request so that the surveyor's map can be edited and the final map completed within the allowed time limit.

### *Inverse Suit Survey*

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An inverse suit is a legal action filed by a property owner against the DOT. The Legal Department furnishes duplicate copies of the papers in the Legal action to Location & Surveys. The date near the bottom of the cover or authorization sheet is the date when the final map is required to be in the hands of the DOT Trial Attorney.

All of these papers should be read and thoroughly understood by the surveyor. The description of the property involved in the suit should be checked with the deed on file in the Public Records of the particular county.

Inverse suits require making a substantially comprehensive title search. In these cases the description of property involved is furnished by the petitioner and may be inaccurate and rarely gives chain of title.

Pay particular attention to the allegations as set out by the property owner. The surveyor should endeavor to show on the map any information that might have a bearing on those allegations.

### *SAP Survey*

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Sometimes when a case is being settled by Consent Judgment, a map of the property involved is requested. Information shown on the map is used in preparing the judgment. This survey and map is made in the usual manner as for an eleven month survey. However, since the survey is being used for a settlement of the case, time usually is of the essence; and this survey should be completed as soon as possible. Emphasis should be placed on completeness and correctness of information shown for the R/W Tracts and Easements. Topography on the map is not necessary unless it is specifically requested.



### *Other Surveys*

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At various times the Property Survey Division of the Location Department is called upon to make special surveys, such as Residue Surveys, surveys for Advance Acquisition of R/W, surveys of State Property, Borrow Pit surveys, wetland mitigation surveys and stream mitigation surveys among others.

Special instructions regarding the nature and scope of the survey, and the content and format of the mapping usually are issued at the time these surveys are requested.

### *Courthouse Research*

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Deed and tax records should be investigated to determine pertinent information regarding the subject property. All of the property described in exhibit "B" in the legal file should be included in the survey. All parcels of land which have been divided from the property described in exhibit "B" and conveyed to others, before the date of taking, should be researched to allow proper delineation and labeling as an exception on the preliminary map. Any other recorded documents affecting the subject property including easements for ingress and egress, utility easements, leases, right of way agreements and recorded maps should be copied and bound to the left side of the property survey folder. If adjoining deeds or plats are used to establish property lines, copies of these adjoining deeds and **legible size plats** should be included in the file.

Contiguous property belonging to the property owner in question (the defendant in the complaint) as of the date of taking (the date on the cover sheet of the complaint) should be researched. To accomplish this, adjoining property should be researched to determine that it does not belong to the defendant. If the defendant in the complaint owns contiguous property, which is being used in the same way as the subject property, but the complaint's land does not cover, it may have been inadvertently left out of the complaint. If you believe this has happened you should notify the Property Surveys Engineer immediately. In this case the complaint may have to be amended.

When any discrepancies are found in property ownership as shown in the Legal file, they should be reported to the Property Survey Engineer immediately so that the Legal Department can amend the Exhibit "B" (description of property affected) in the file.

## Field Surveys

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### A. Property Line Ties

All property lines within area of taking are to be tied to the appropriate alignment to the nearest 0.01' in English surveys or nearest millimeter for metric surveys. Locate all existing monumentation and appurtenant evidence necessary to establish property lines and corners involved in the take.

### B. Total Area of Property

The complete boundary of the property in question is to be plotted and closed out. This may be done by plotting the deed descriptions if the total boundary is not surveyed. The property lines are to be annotated with deed bearings and distances. On lines that are surveyed, DOT bearings and distances should be shown also. The total area used should be from the most accurate source available (deed, tax map, computed, etc.) and shown in the Table of Areas. An area obtained when a deed is computed and forced to close should be used only as a last resort. Deed, plat or tax record areas are preferred. Total remaining area is to be shown in the Table of Areas. All separate and isolated remaining areas are to be labeled on the map but not broken down in the Table of Areas. Care should be taken to insure that all of the separate and isolated remaining areas shown on the face of the map add up to the remaining area shown in the table.

### C. Topography

Show woods, cultivated and open land, roads, streets, trails, buildings and other structures as of the date when the Civil Action was filed (as best as can be determined). This information can be taken from aerial photographs, which usually are available. Show the original location of buildings and other structures, which have been removed during construction. The information for showing these locations may be taken from the field survey, Location topography files or construction plans. Improvements located on remote areas of the subject property far from any areas of take do not need to be located as precisely as those close to or in the areas of take. These Improvements may be scaled from county topo maps or other sources. Utility information such as poles, underground service lines, and other structures not affecting appraisal are not normally shown. The existing width of right of way, maintained right of way, whether paved or not and width of pavement should be shown on all roads.

When a building is located near a R/W line, the exact distance from the R/W line and /or appropriate alignment to the closest corner of the building should be shown. *(Since there is no requirement to determine what is classified as near, please use your own discretion).*

## *Map of Survey*

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The map of each survey should conform to the following:

### Size of Maps

Property Survey Maps are prepared the following sizes: 16" x 19", 19" x 32", 22" x 36" and 30" x 36". When absolutely necessary, a sheet larger than 30" x 36" is used, although this procedure is not preferred by the Legal Department. Before preparing a map larger than 30' x 36' contact the Property Surveys Unit for approval. Usually maps larger than 30" x 36" can be avoided by the creative use of insets.

Preliminary maps of surveys, prepared by the field offices, should conform to the above sizes.

## *Scale of Maps*

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All maps should be drawn to such scale that the survey will conform to the map size as stated above, and that the map can be clearly read and understood. Particular attention should be paid to any congested areas. Enlargements or insets may be used for clarity. Insets do not have to be drawn to scale. In order to choose the proper scale for a map, all of the different areas to be shown on the map (right of way take, easements and remaining area) should be computed and stored as parcels before the map scale is chosen. Once the parcels have been stored they can be visualized in Geopak and title sheets of various sizes at various scales can be tried until the proper sheet size and scale are determined. Usually a smaller scale than "plan sheet scale" (usually 1"=50' or 1:500) should be used. Once the map size and scale are chosen the parcels should be visualized, the tables built and the map plotted to make the final determination if the map size and scale are appropriate. No text or topo should be placed on the map until the decision as to sheet size and map scale has been determined. This is a very important aspect of the mapping process. Extremely large and/or multiple page maps are usually unnecessary.

## *Accuracy of Map*

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If possible, error of closure in the deed description should be forced into one line as far as possible from the areas of taking.

Note:

In order to produce a correct, complete map, *you must follow the check list attached in your folder(See Fig. 4).*

## *Research*

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- A) Retrieve a copy of the Design/construction plans and check against what was surveyed. Check to see if there are any property line changes. If there is, contact the designer (or managing unit if this section has been contracted to a private firm) so they can produce an R/W change request. Continue checking for any other inconsistencies.
- B) Read the “Exhibit A & B” to make sure the “Take” that was appraised coincides with what is on the design/construction plans. Make sure you read the “Preliminary Report of Title”. This will give you an indication of what needs to be shown on the map.
- C) Check the most recent deeds and/or plats. Make sure that it is represented on our map correctly. If you find any inconsistencies or any conflicts with the subject area/areas, contact the attorney and/or the Location and Surveys Division Office if you’re a consultant.

Notes:

Please note in the folders any conversations, email, etc. so that you have an accurate chain of events.

- D) Try to retrieve the “Tax Office Appraisal Report”. This will give you what was actually appraised and will enable you to find any problems before it goes to trial. See fig. 1



Fig.1

### R/W Tract

Tie each tract to a station on the appropriate alignment by bearing and distance to the beginning point of the tract. If the sideline of the tract is perpendicular to or close to being perpendicular to the survey line to which it is being tied, tie the tract by extending the sideline to an intersection with the survey line. This should result in the bearing of the tie line being the same as the bearing of the sideline of the tract. Be sure to compute the intersection point in your gpk file. If the sideline is parallel to or close to parallel to the survey line, tie to the beginning point of the tract with a tie line perpendicular to the survey line.

MDL Application "NCTables.ma" allows ties to be easily accomplished. To tie by extending the sideline of the tract the intersection point number must be previously computed. Choose reference method "point" and enter the point number in the "point name" box. To tie the tract with a tie line perpendicular to the survey line choose reference method "right angle plus". The software computes the right angle plus for you. Remember that rules are made to be broken. If the specified tie method

makes your map look foolish or confusing use your good surveying judgment and your creativity to produce the best product possible.

Number each tract when more than one is required. "NCTables.ma" uses the point numbers stored in your gpk file to designate points in the table of metes and bounds. There is no need to change the numbers to letters. Be sure to number the tract corners on your map to match the metes and bounds table. Designation of points should run in a clockwise direction. Any questions regarding R/W should be discussed with the Division R/W Agent. Be sure to label each R/W monument on the map with its station and offset from the appropriate survey line.

#### ***Drainage Easement (Permanent and Temporary)***

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Tie in the same manner as for R/W Tracts. Number each easement. As with right of way tracts "NCTables.ma" uses point numbers stored in your gpk file to designate points in the table of metes and bounds. There is no need to change the numbers to letters. Do not assign a number to a point previously designated as a point on a R/W tract. R/W tract point numbers should be used. Designation of points should run in a clockwise direction. Any questions regarding easements should be discussed with the Resident Engineer and/or Division R/W Agent. It is not necessary to label stations and offsets to easement points that do not coincide with a right of way monument.

#### ***Slope Easements***

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Same rules apply as for drainage easement.

(Slope Easement needs to be shown even when it overlaps an existing Private Easement).

#### ***Temporary Construction Easement***

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Same rules apply as for drainage easement.

#### ***Utility Easement***

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Same rules apply as for drainage easement.

#### ***Temporary Detour***

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Same rules apply as for drainage easement.

#### ***Numbering and labeling of the Table of Metes and Bounds***

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When more than one R/W Tract is required, corresponding numbers should be used for the tables in the following manner: New R/W # 1, New R/W # 2, etc.

Tables for Drainage Easement, Temporary Construction Easement, Slope Easements, Temporary Detour, Borrow Pit Area and Haul Road should be numbered in the same manner.

A table of metes and bounds for each area of R/W and/or easement taking shall be made. The table should include the bearing and distance of each straight course and the bearing and distance, arc length, radius and direction (right or left) of curved courses. For metric projects, both English and metric distances are to be shown. MDL Application "NCTables.ma" will create your table for you from a parcel stored in your gpk file. You must remember to store the parcel with the point number of the pc and pt of each curve, in addition to the name of the curve. Parcels should be stored in a clockwise direction.

### Table of Areas

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The table of areas should be built using MDL Application "NCTables.ma" and should appear as follows:

TOTAL AREA \_\_\_\_\_ EXCLUDING EXISTING RIGHT OF WAY \_\_\_\_\_

NEW R/W \_\_\_\_\_

REMAINING AREA \_\_\_\_\_

REMAINING AREAS SUBJECT TO EASEMENTS:

PERMANENT DRAINAGE EASEMENT \_\_\_\_\_

TEMPORARY DRAINAGE EASEMENT \_\_\_\_\_

SLOPE EASEMENT \_\_\_\_\_

\*UTILITY EASEMENT \_\_\_\_\_

TEMPORARY CONSTRUCTION EASEMENT \_\_\_\_\_

\*Permanent Utility Easement (PUE), Drainage and Utility Easement (DUE), Temporary Utility Easement (TUE), and Aerial Utility Easement (AUE)

If part of the total area is in the existing right of way, and the total area in the table excludes the existing right of way, the area in the existing right of way should be shown in the lower left corner of the map.

### *Additional Information Required on Map*

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In the upper left-hand corner of the map, indicate the Property Survey Division File number, the Legal Department File number and the Parcel number as follows:

PSD #

TIP #

PROJECT /WBS. #

PAR #

Township

In the title show the property owner's name, as indicated on the letter from the Attorney General's Office, which accompanies the complaint, county, and CVS #.

Include PLS #'s of Locating Engineer and Surveyor if licensed.

Be sure that the map is oriented so that the north arrow points up in the upper 180 degrees of the map.

Give the scale of the map and the scale of the inset (when inset is drawn to scale) or enlargement if one is required. Insets do not have to be drawn to scale. If not, you must label them as "not to scale".

On the Project road and intersecting road or roads, provide the US Highway or Secondary Road number and the nearest town in each direction from the property.

On surveys involving a Controlled Access road, be sure that all roads upon, contiguous to or near the property are shown and designated by local name and number. Show distance to nearest access road from project road. Show the distance to the nearest road intersection when a Service Road is provided for a tract of land,

On property lines actually surveyed, label with DOT bearings & distances as well as the deed and/or plat bearing and distance. On property lines within R/W or easement taking, DOT bearings and distances should not be labeled, as they will be shown in the tables. On metric projects, lines should be labeled with English and metric distances.



Describe all property corner monuments found and used in the survey. If a fence, hedge, ditch, stream or other natural feature is used as a boundary or property line, indicate it on map.

If a property owner points out a property line on the ground, make a note to that effect on the map.

For Controlled Access, indicate C/A on the R/W lines and show any access points by L line or Y line station and the width of the access.

End of Control of Access lines should be indicated on Secondary or other roads where Control ends.

R/W monuments which are included in a table of metes and bounds should have the ncrop "ROW new monument" symbol on point showing. ROW monuments, which are not included in a table of metes and bounds, should have the "place ROW new monument" symbol without point showing. R/W monuments should be labeled with a station and offset from the appropriate survey line.

### *Priority of Jobs Assigned for Survey*

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Unless otherwise instructed, the following priority should be strictly adhered to in jobs assigned for survey.

1. Revisions. These jobs are usually calendared for trial at an early date or the revisions are required by court order.
2. Surveys required for writing descriptions to be used in settling cases by default or consent judgment. These jobs are marked "SAP" (soon as possible) on transmittal sheet.
3. Z Jobs. These jobs should be surveyed in order based on the date shown at the bottom of the authorization sheet. Every effort should be made to survey and return these jobs promptly so that the required editing and final drafting can be completed before the due date.
4. Inverse Suit. The date near the bottom of the authorization sheet is the date when the final map is required to be in the hands of the Attorney General's Office Trial Attorney. Every effort should be made to survey and return these jobs promptly so that the required editing and final drafting can be completed before said date.
5. Eleven month jobs.

### *Completing the Job*

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After the survey and map are completed, the map and notes of the survey should be checked against the survey checklists for complete coverage of all items called for on the list.

When every item is found to be in order, all of the field notes, copies of deed descriptions, copies of plats, and all other information regarding the survey, including the survey check lists, should be bound on the left hand side of the manila folder.

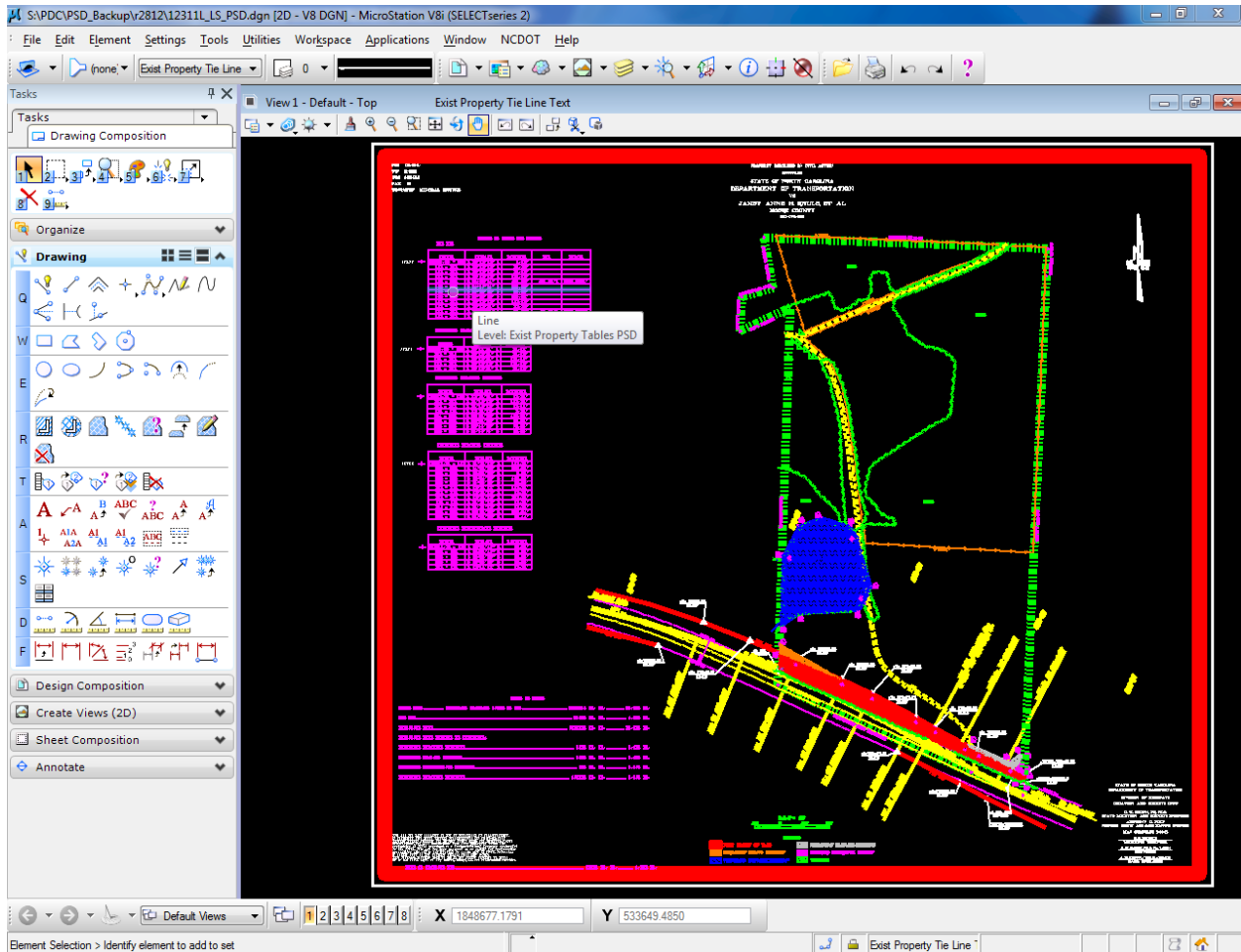
The electronic file is to be transmitted and file folder mailed to Central office when the survey is completed and checked. Electronic files should be named by the PSD# followed by an f (for field) with an extension of .psd. (example. 70198f.psd). See the naming convention sheet under the Connect NCDOT web site.

### *Preliminary vs. Final Maps*

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The map that you prepared in the field office, or had prepared by a private engineering firm, under your supervision, is called the “preliminary map”. The preliminary map will be used by the Property Survey Section to prepare a “final map”. The final map is a court exhibit used by the Attorney General’s Office attorney to present DOT’s case. The “final map” may differ significantly from your preliminary map. The attorney will often request that a preliminary map be simplified as much as possible in order that a jury can understand it. Often information that would be quite valuable to a surveyor but would only serve to confuse a juror is removed. Your preliminary map is the map you will have to support if you are called to testify in court. This map should accurately portray all of the evidence that you gathered in the field to help you make decisions concerning the boundary and areas of taking. Useful information that you don’t want to appear on the face of the map can be placed on any unused level. See **Fig. 4** for Preliminary map check list.

# NCDOT LOCATION AND SURVEYS UNIT FINAL MAP GUIDLINES



## 1) Research

See Research under the property survey section. Also check the Preliminary Condemnation Map Checklist. (see fig. 4)

## 2) Scaling, Checking and Map Arrangement

(Checking plan sheets against our map)

### a) Overlaying plan sheets over our map for checking

This is one way to quickly see if the graphics match the data from our survey and the data collected by our field office or professional engineering firm. Check all monuments, iron pins, easements, etc. to make sure there are no inconsistencies. **THIS IS NOT AN END ALL TO THE COMPLETION OF THE FINAL MAP.**

### b) Complete your check list (see example of check list on fig. 5)

### c) Look at the overall view to make sure that it is easy to follow

Keep in mind, the final map is an exhibit primarily to make our map legible so a layman would understand it.

Make sure that everything on the map is **uniform, organized, and neat.**

All tables (Table of Metes and Bounds, Table of Areas) should be at a legible scale (Not too large or too small). Try to keep all tables together and aligned. (See map on previous page)

## 3) Patterning

Make sure that the pattern is the correct one and of the correct scale.

Make sure that any numbering or labeling in the patterned areas is clear and not cluttered.

Patterning should be cut away from the numbering or labeling.

Make sure the patterning is placed on the key.

## 4) Math Checks

a) Make sure all tables are correct and that they close to Location and Surveys specifications and tolerances.

b) Make sure all areas add up correctly.

Make sure all maps look **professional, neat, organized**, and easy to follow.

Make sure all text, symbols, line weight, and patterning is of the right specification size and weight. When you compute everything, always go back to the check list to make sure you haven't missed anything.

## 5) Legal Description

- a) Make sure you run a legal description after your map has been completed and checked.
- b) Store description on the "S" drive with the dgn files until it is requested by the legal office.  
*(Soon we will be sending out legal description along with a pdf of our map during the distribution period.)*

## 6) File Naming and Placement

- a) Electronic files should be named PSD#L\_Is\_psd.dgn. and if there is a revision then it should look like PSD#Lr\_Is\_psd.dgn.
- b) If the map was finalized in house then put the file in the "S" drive under pdc/psd backup/TIP#/PSD#.

Below are some map examples of a final map

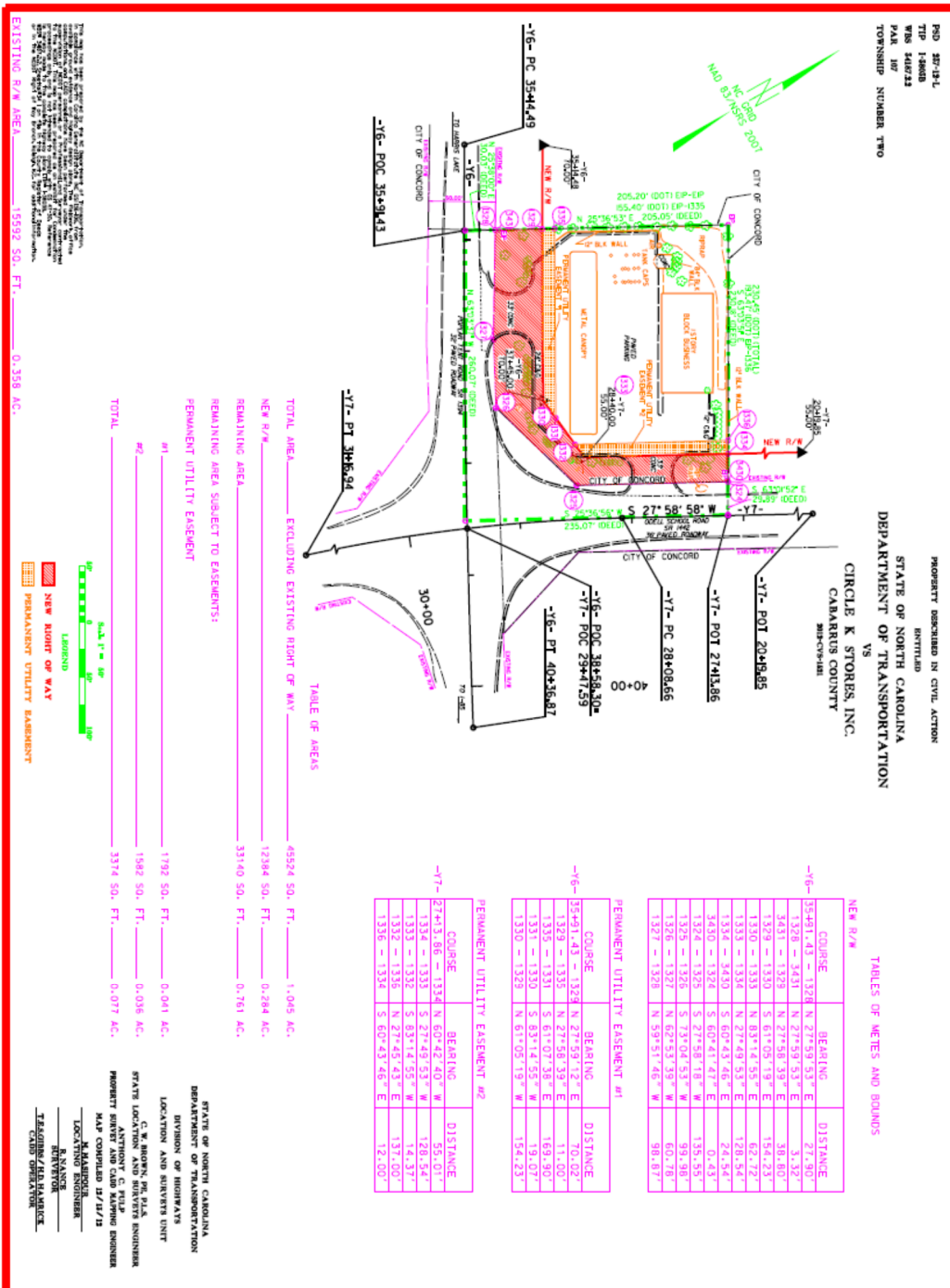


Fig. 1

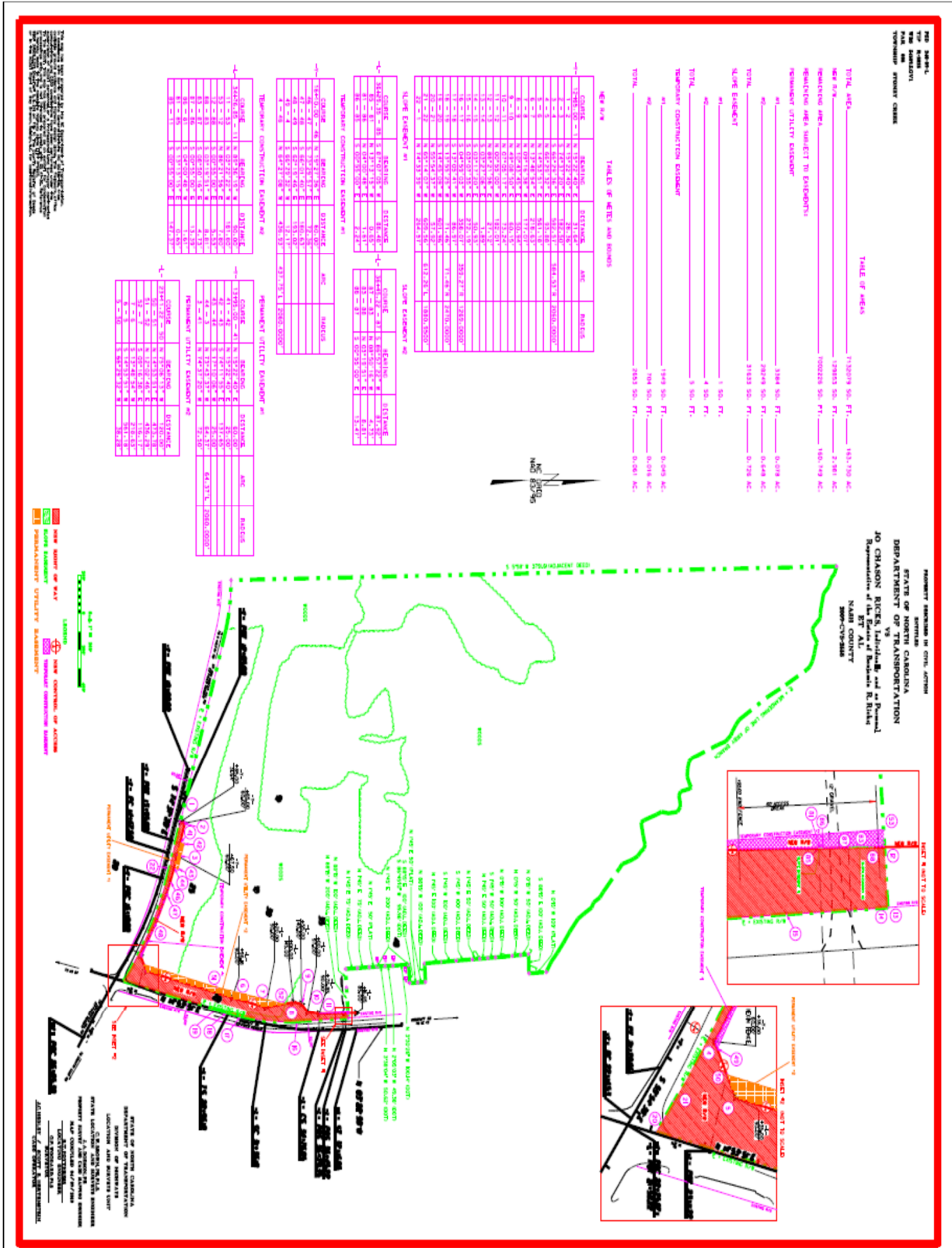


Fig. 2

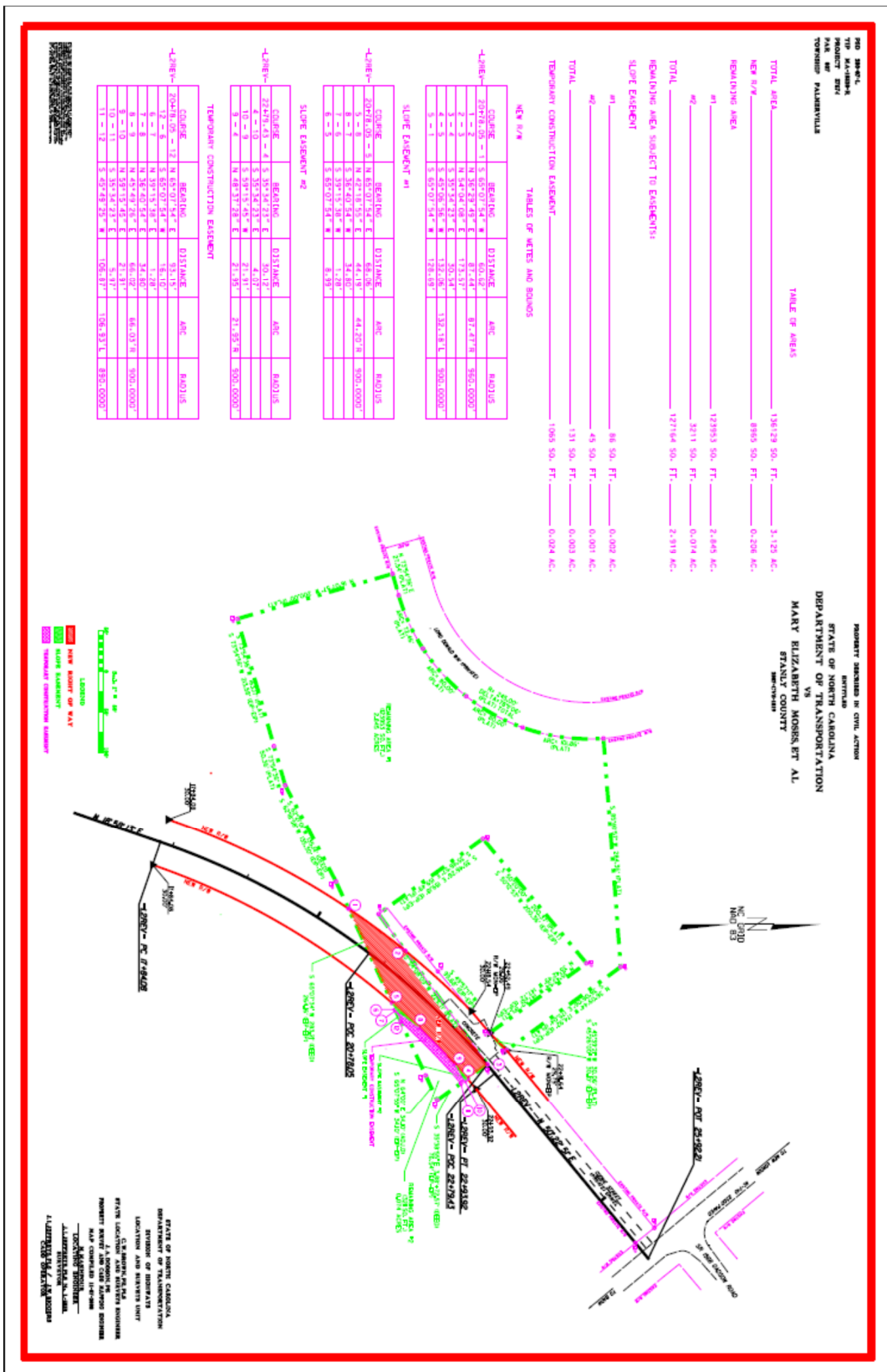


Fig. 3



*Below is a check list all Cadd compilers should adhere to.*

### **Preliminary Condemnation Map Checklist**

1. Do deeds included in **Preliminary Certificate of Title** cover all contiguous property owned? If not, are copies of additional deeds included in file?
2. Are all exception deeds listed in **Preliminary Certificate of Title** (prior to date of filing condemnation)? If not, are copies of exception deeds included in file?
3. Are all utility easements of record listed in **Preliminary Certificate of Title**? Check for width and type.
4. Has Right of Way Agent been contacted regarding verification of ROW and other pertinent information that may be available? Basis for ROW: ROW agreements, maintained ROW, old plans, existing monuments, property line or other situation (explanation required).
5. Has Resident Engineer or other responsible authority been contacted regarding easements?
6. Has a verifying letter for items **4** and **5** been included in the file?
7. Are all survey notes, or copies, legible and included in the file?
8. Have the following items been properly shown in the mapping?
  - All deeds descriptions in items **1** and **2** are delineated and labeled with deed calls, deed references, tract numbers, etc.
  - All existing and proposed access roads.
  - All buildings and other improvements (classified as to construction and use) and distance from ROW line to nearest corner(s), if applicable.
  - All woods, cultivated and fallow land, etc. delineated.
  - Other topography shown affecting appraisal.
  - All public roads with ROW width, number and/or name, and destinations shown.
  - All property corners labeled (EIPs, axles, etc.).
  - All existing and proposed **Control of Access** (C/A) and **ROW** lines with access points (if any).
  - All utility easements with width and ownership.
  - All slope, temporary construction, temporary drainage, permanent drainage easements, etc. shown and properly labeled.
  - All new ROW shown in conformance with plans or other proper authority.

- Tables of metes and bounds for areas of taking.
- Table of areas shown in square feet and acres.
- Remaining areas. All remaining areas separated by roads or streets, etc. should be shown individually within their respective area on the map.
- Affected parking areas and individual spaces (if delineated by markings).
- Right angle station and offsets to all proposed ROW monuments.
- Date of survey. Should be the date of field work in case court testimony is required.

9. Does preliminary map agree with adjacent condemnation mapping?

10. Title of map, if a civil action, should agree with name, or titles of parties, to the legal action set forth in the complaint.

11. Any pertinent items should be included in the file and/ or shown on the preliminary map.

CHECK LIST FOR PROPERTY SURVEYS  
PRELIMINARY MAPS

PSD # \_\_\_\_\_ CHECKED BY \_\_\_\_\_

PROJ # \_\_\_\_\_ DATE \_\_\_\_\_

- \_\_\_ 1. NO UNUSUAL ABBREVIATIONS
- \_\_\_ 2. ALL DEEDS, PLATS, SLOPE STAKE INFORMATION, REVISED PLANS AND OTHER PERTINENT INFORMATION PUT IN FILE.
- \_\_\_ 3. SHOW ALL EXCEPTIONS
- \_\_\_ 4. BEARINGS AND DISTANCES AROUND EXCEPTIONS ARE SHOWN AND LABELED ADJ. DEED
- \_\_\_ 5. DATE MAP COMPILED
- \_\_\_ 6. SCALES AND DISTANCES ARE CORRECT (MAP SCALES CORRECTLY)
- \_\_\_ 7. ALL MONUMENTS ARE CORRECT WITH PLUS (+) AND DISTANCE OVER
- \_\_\_ 8. NORTH ARROW IS ON DRAWING WITH CORRECT ORIENTATION (NAD 83 ETC)
- \_\_\_ 9. HEADING IS CENTERED
- \_\_\_ 10. SHOW TRACT LINES
- \_\_\_ 11. ALL BEARINGS ON THE SAME LINE ARE THE SAME (NO ROUNDING ERROR ON SHORT LINE SEGMENTS).
- \_\_\_ 12. ALL BEARINGS AND DISTANCES ARE CENTERED ON LINE (IF POSSIBLE).
- \_\_\_ 13. SQUARE FOOTAGE IS ROUNDED OFF TO NEAREST SQUARE FOOT.
- \_\_\_ 14. ALL NUMBERS/LETTERS ARE LINED UP IN TABLES.
- \_\_\_ 15. PAVED ROADS ARE LABELED PAVED ROADWAY AND WIDTH OF PAVEMENT IS SHOWN..
- \_\_\_ 16. EXISTING R/W IS LABELED AND IS ON OUTSIDE OF LINE (IF POSSIBLE).
- \_\_\_ 17. IF PART OF PROPERTY IS IN EXISTING R/W, EXISTING R/W IS EXCLUDED FROM TOTAL AREA & SHOWN IN  
LOWER LEFT CORNER (EXISTING R/W=100 AC.).
- \_\_\_ 18. DEED BEARING NEXT TO PROPERTY LINE IF POSSIBLE.
- \_\_\_ 19. CHECK TABLES (BE SURE TABLES CLOSE)
- \_\_\_ 20. ALL ACRES IN TABLES SAME AS ACRES IN TABLE CHECK (RDS RUN, INSURV, GEOPAK SURVEY MAP CHECK ETC)
- \_\_\_ 21. DO NOT USE I, O, OR LOWER CASE I, O, L IN TABLES.
- \_\_\_ 22. SHOW ADJACENT PSD #.
- \_\_\_ 23. SHOW DESTINATION ON ROAD IN EACH DIRECTION.
- \_\_\_ 24. ALL TABLES ARE IN CORRECT FORMAT AND TOTALS IF REQUIRED ARE CORRECT.
- \_\_\_ 25. TABLES OF METES AND BOUNDS AND TABLE OF AREAS ARE LABELED CORRECTLY.
- \_\_\_ 26. YOUR NAME AS CADD COMPILER.
- \_\_\_ 27. NEW R/W IS LABELED CORRECTLY ON LINE AND ON TRACTS IF MORE THAN ONE.
- \_\_\_ 28. CHECK FOR CONTROL OF ACCESS (LABEL EVERY LINE THAT IS CONTROLLED). ALSO INDICATE ACCESS BREAKS.
- \_\_\_ 29. DO NOT DUPLICATE DOT BEARINGS ON PROPERTY LINES IF BEARINGS ARE SHOWN IN TABLES.
- \_\_\_ 30. IS ALL TOPO SHOWN (BOTH PLAN SHEET TOPO AND ANY OTHER TOPO NOT SHOWN ON THE PLANS).
- \_\_\_ 31. FULL STATION IS SHOWN IN TABLES, AND STATION IS CORRECT.
- \_\_\_ 32. ALL PLS NUMBERS ARE FILLED IN CORRECTLY.
- \_\_\_ 33. ALL AREAS LESS THAN AN ACRE SHOWN IN SQUARE FEET (TO NEAREST SQUARE FOOT)  
ALL AREAS LESS THAN A HECTARE SHOWN IN SQUARE METERS (TO NEAREST TENTH OF A SQUARE METER).
- \_\_\_ 34. CHECK ET UX, ET AL, MAP SHOULD AGREE WITH COMPLAINT.
- \_\_\_ 35. CURVE DIRECTION LEFT OR RIGHT IS SHOWN ON ARC'S.
- \_\_\_ 36. THE WORD EXISTING IS NOT ABBREVIATED ON EXISTING R/W (NOT EXIST. R/W).
- \_\_\_ 37. PROPERTY CORNERS TIED TO THE ALIGNMENT THAT THE NEW R/W IS BASED UPON WITH STATION, BEARING AND DISTANCE.
- \_\_\_ 38. EIP SYMBOLS ARE ON ALL CORNERS.
- \_\_\_ 39. NEW R/W IS SHOWN PAST PROPERTY LINE WITH PROPOSED WIDTH SHOWN, IF WIDTH IS UNIFORM, OR TO NEXT MONUMENT IF NOT UNIFORM.
- \_\_\_ 40. REVISION DATE IN LOWER RIGHT CORNER NEXT TO NAMES (IF REVISED).
- \_\_\_ 41. ALL ALIGNMENTS ARE LABELED.
- \_\_\_ 42. LABEL ROADS WITH LOCAL NAME AS WELL AS STATE OR US NUMBERS
- \_\_\_ 43. MORE THAN ONE OF THE SAME EASEMENT LABEL #1, #2, ETC.
- \_\_\_ 44. ALL TABLES IN CLOCKWISE ORDER.

- \_\_\_ 45. REMAINING AREA DIVIDED BY ROAD OR R/W ETC. SHOWN IN EACH AREA ON FACE OF MAP. CHECK THAT INDIVIDUAL AREAS ADD UP TO THE TOTAL SHOWN IN THE TABLE OF AREAS.
- \_\_\_ 46. LABEL ALL EXISTING EIP'S, MONUMENTS, TREES ETC.
- \_\_\_ 47. DOT BEARINGS AND DISTANCES ON LINES ACTUALLY PHYSICALLY TIED. DEED BEARINGS AND DISTANCES ON ALL LINES.
- \_\_\_ 48. INSET SHOWN FOR CLARITY (IF NEEDED)
- \_\_\_ 49. CHECK PSD #, TIP #, PROJECT #, PARCEL #, TOWNSHIP, AND CVS # (Check with the case pending list)
- \_\_\_ 50. USE PROPER TITLE FOR INVERSE SUITS
- \_\_\_ 51. HAS THE TOPO BEEN VERIFIED BY A FIELD VISIT?

**Fig. 4**

## **PDC Checklist -- Technician**

1. All deeds, plats, slope stake information, project plans (or revised plans) and other pertinent information placed in file.
2. Date of survey shown.
3. All exceptions shown correctly with bearings and distances labeled **Adjacent Deed**.
4. Map scales correctly and has a legend.
5. No unusual abbreviations used, i.e., **BST** should be shown as **PAVED**.
6. All proposed monuments are correct with station and offset.
7. North arrow is shown with correct datum.
8. Tract lines are removed when creating final exhibit map.
9. In tables of metes and bounds -- all points that share a common property line -- the bearings between them should be the same (in other words, no rounding error on short line segments).
10. All bearings and distances should be centered along property line, if possible.
11. Square footage in table of areas is rounded to the nearest square foot.
12. All numbers are properly aligned in tables of metes and bounds.
13. Paved roads are labeled as **Paved Roadway** with width shown.
14. Existing R/W is shown with proper line style, width and label. Label line should be on the outside of property, if possible.
15. If a portion of property is in the existing R/W, existing R/W is excluded from total area in table of areas and shown in the lower left corner, i.e., Existing R/W = 100 AC.
16. Check tables of metes and bounds to ensure they close using Geopak's Map Check program (raw run, no error reduction method applied such as Least Squares). A difference of 2 or 3 square feet between map check's value and Geopak's parcel store will occur sometimes – hold the GPK value as shown on the preliminary map in most cases. However, check total error in your map check run to ensure it's within acceptable tolerance. *Run map check using the entire bearing (out to the seconds) and distance (to the 2<sup>nd</sup> decimal place) as displayed on the total areas.*
17. Any adjacent claims should agree when checking tables of metes and bounds.
18. Show destination on road in each direction.
19. Ensure tables of metes and bounds and table of areas are in the correct format.
20. Your name as CADD compiler should be shown on the final exhibit map.
21. New R/W should be shown correctly and labeled (along proposed line and independently labeled when multiple areas exist).
22. Check for control of access (label all lines that are controlled). Show access breaks per project plans.
23. Don't duplicate DOT bearings on property lines if they're shown in tables of metes and bounds.
24. Full station is shown in tables of metes and bounds, and tied correctly to the appropriate proposed alignment.
25. Check legal packet to ensure map name agrees with complaint, along with Latin extensions, i.e., et al, et ux, et vir.
26. Ensure curve directions are shown correctly on arcs with their correct radius.
27. Ensure the word existing is not abbreviated on Existing R/W labels.

28. EIP symbols are on all corners and labeled as EIP when irons are discovered.
29. New R/W is shown past property to next proposed monument or show proposed width if R/W is uniform.
30. All proposed alignments are shown correctly with label.
31. Label roads with local name as well as State or US numbers.
32. If more than one of the same easement, ensure they are labeled as #1, #2, etc.
33. All tables need to read in clockwise order.
34. When there is remaining area divided by highway or road, check areas to ensure they total correctly with remaining area in Table of Areas. Remaining area value should be shown on the map in their individual areas.
35. DOT bearings and distances on lines are physically tied.
36. If needed, inset(s) are created for clarity.
37. Check PSD#, TIP#, WBS#, Parcel#, Township and CVS# (case pending list). Also check disclaimer note.
38. Use proper title block for inverse suits (I) and right of way mapping (RW).
39. Has topography been verified by a field visit?
40. Place revision date in lower right corner, next to name block, when revisions are completed.
41. Place correct patterning on individual areas and in legend.
42. Ensure easement descriptions match tables of metes and bounds on condemnation map.

**Fig. 5**