

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
Washington, DC 20314-1000

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Regulation
No. 1-1-11

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Administration
PROJECT SCHEDULES

1. Purpose. This regulation states the policy on the use of various schedule management methods. The basic regulation provides general policy relative to the use of methods (bar chart, Critical Path Method (CPM) Project Schedule) and contract administration. If this Engineer Regulation (ER) conflicts with the Federal Acquisition Regulation or any of its supplements, they must govern over this ER.

2. Applicability. This regulation is applicable to all US Army Corps of Engineers (USACE) commands.

3. Distribution Statement. Approved for public release; distribution is unlimited.

4. References.

a. Federal Acquisition Regulation (FAR) 52.236-15 Schedules for Construction Contracts, <https://www.acquisition.gov/sites/default/files/current/far/pdf/FAR.pdf>

b. Federal Acquisition Regulation (FAR) 52.249-10 Default (Fixed-Price Construction), <https://www.acquisition.gov/sites/default/files/current/far/pdf/FAR.pdf>,

c. Unified Facilities Guide Specifications (UFGS) 01 32 01.00 10 Project Schedule, <http://www.wbdg.org/ffc/dod/unified-facilities-guide-specifications-ufgs/ufgs-01-32-01-00-10>

5. Policy. Obtaining quality construction on time and within budget is a primary goal of the USACE. To help manage the time specified for the completion of a contract, a schedule is required per FAR 52.236-15 (reference 3.a). The contractor is responsible for scheduling the work and tracking progress so that the contract completion date is met. The Contracting Officer or Administrative Contracting Officer/Professional Engineer-in-Charge (ACO/AE/RE) monitors the contractor's schedule to assure compliance. If a schedule is not provided, or the schedule changes are unacceptable, the Contracting Officer or ACO/AE/RE must withhold progress payments per FAR 52.236-15(a). If actual progress fails to meet the schedule, the Contracting Officer or ACO/AE/RE must take appropriate actions to assure compliance with contract

*This regulation supersedes ER 1-1-11, dated 15 June 1995.

requirements per FAR 52.236-15(b). An accurate schedule is critical to ensure effective construction management for both the contractor and the Government.

Bar charts can be used to manage simple projects. On complex construction projects or other projects with many interrelated activities, a Critical Path Method (CPM) project schedule is recommended. CPM is a tool for analyzing progress, projecting completion, and calculating payment commensurate with actual progress. CPM must be carefully reviewed and updated regularly to be effective. The Chief of Construction is responsible for determination the appropriate project scheduling method. The Contracting Officer or ACO/AE/RE will accept the schedule. The Standard Data Exchange Format must be used to facilitate the transfer of schedule data between the Contractors' Quality Control System (QCS) and Governments' Resident Management System (RMS).

6. Description. The Project Schedule represents the sequence and interdependencies of work and must accurately represent the intended work sequence. Once the activity is assigned, a methodology (usually CPM) is required which calculates early start, late start, and finish dates for the activities, as well as, the float available. Resource data such as cost and required codes must be entered for activities. The schedule data can be ordered in different sorts and compiled into specific reports for management purposes. Actual progress must be entered once work commences. Based on this progress with actual start dates, actual finish dates, percent complete, and remaining duration recorded, progress payments can be calculated.

7. Use.

a. The Project Schedule, being a management control tool, may be applied to many aspects of work by the USACE. Project Schedules can be utilized by management for in-house analysis such as engineering and design, and life cycle project management. An example is in forecasting annual office budgets by analyzing projected placement from early finish and late finish sorts if costs have been assigned to those activities. In the planning phase, schedule analysis can be used to set construction durations prior to advertisement or it may be used in running scenarios for acquisition selection, i.e. design build (D-B) vs design bid build (D-B-B).

b. Construction schedules, after contract award, must be contractor prepared and involve the subcontractors and suppliers in the actual planning. The Project Schedule should be of sufficient detail to allow both construction planning and management by the contractor and contract administration by the Government. Updating of actual progress should be performed by the contractor with Government concurrence as the update will project early or late contract completion and progress payment due.

c. Changes to the work and occurrences which impact progress must be considered in the schedule to keep the schedule up to date and to reflect actual job progress. Determination can be made of where the contractor must accelerate to regain the schedule when behind due to its own actions. If applicable a determination of the impact and effect of Government actions on the

contractor can be made in order to provide equitable adjustments to the contract time as required. The Contractor and Government should review potential delays and determine the most appropriate method for capturing the impact.

8. Contract Administration.

a. When the Chief of Construction has determined what type of a project schedule will be specified for use on a construction contract, the provision of the specifications must be carefully edited for the specific job. UFGS 01 32 01.00 10 (reference 3.b) contains notes indicating where such editing can be done. This editing is mandatory.

b. The contractor should submit its baseline and initial Project Schedule within the time required by the UFGS 01 32 01.00 10. The schedule must be verified as being logical and the completion dates attainable. Failure to enforce this requirement is highly detrimental to project management. Progress payments must not be processed until an acceptable Project Schedule has been submitted. The Contracting Officer or ACO/AE/RE may not allow work to start nor make progress payments until an acceptable schedule (preliminary, initial, or update) is received and accepted. Once accepted, the schedule must be maintained and be up-to-date with regard to job progress and logic changes by the contractor.

c. Appendix A contains the Standard Data Exchange Format specification. This format must be specified and used to transfer contract schedule data between different contractor and Government project schedule programs.

9. Implementation. The Project Schedule is a valuable tool in both USACE (1) life cycle project management and (2) contract administration. The Project Schedule data can be used to project contract completion, schedule Government actions, incorporate changes and document occurrences during execution of the contract, analyze their effect on the contract completion, and arrive at equitable adjustments. The following actions should be implemented to assure effective management by use of the Project Schedule where it is selected and specified:

a. Assure that appropriate Government personnel at all levels are adequately trained in the use and review of the Project Schedule. Basic training is available through the Headquarters, US Army Corps of Engineers (HQUSACE) Proponent Sponsored Engineer Corps Training (PROSPECT) 080, Construction Schedule Performance Management Program.

b. Carefully edit UFGS 01 32 01.00 10 to fit job requirements.

c. Transfer data between contractor quality control system (QCS) and Government resident management system (RMS) project control systems via the Standard Data Exchange Format.

d. After receipt promptly and carefully review the Project Schedule submission. A conference type review with the contractor is effective. Verify the schedule logic, contract conformance, and accept or reject the schedule promptly.

e. Enforce all contract clauses and provisions for Project Schedule submission, updating, reporting, and payments. Failure to maintain an accurately updated Project Schedule will undermine the ability to manage the project properly.

f. Include critical submittals, approvals, etc. in the schedule.

g. At the time notice-to-proceed is given for a change order, the contractor will promptly incorporate the logic changes in the Project Schedule for the Contracting Officer or ACO/AE/RE acceptance. The impact to the indicated completion of the Project Schedule will provide the basis for equitable time extensions to the contract if necessary.

h. Reference FAR 52.249-10 Default (Fixed Price Construction). When work is delayed by causes beyond the contractor's control, the contractor notifies the Contracting Officer or ACO/AE/RE within 10 days from the beginning of the delay. The contractor must prepare a Time Impact Analysis (TIA) utilizing the schedule update closest to but prior to the occurrence of the impact or delay. The TIA must include a narrative with facts and justification for the issuance of a time extension for the impact. The contractor must submit an electronic copy of the Project Schedule with activities relating to the impact or delay logically included and it must illustrate how the impact delayed the calculated contract completion date. The electronic copy must be in the exportable form of the contractors scheduling software (i.e. not in an Adobe pdf format). The Contracting Officer or ACO/AE/RE is obligated to review the facts, the TIA provided by the contractor, and analysis performed by USACE personnel to establish the extent of the delay and extend the contract time when justified. These determinations can be made only if the Project Schedule is accurately updated.

i. Avoid specifying proprietary scheduling computer programs. Contractors should be encouraged to prepare their own Project Schedule in lieu of hiring consultants to plan and update their schedules.

FOR THE COMMANDER:

1 Appendix
Appendix A Standard Data
Exchange Format Specification


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APPENDIX A

Standard Data Exchange Format Specification

PART 1 GENERAL

1. Application of this Provision. The Standard Data Exchange Format (SDEF) provides a nonproprietary protocol to exchange project planning and progress data between scheduling systems.
2. File Type and Format. The data file must consist of a 132 character, freed format, "ASCII" file. Text must be left-justified and numbers must be right-justified in each field. Data records must conform exactly to the sequence, column position, maximum length, mandatory values, and field definitions described below to comply with the SDEF. Unless specifically stated, all numbers must be whole numbers. Fields containing numbers must not be zero filled. All data columns must be separated by a single blank column. The file must not contain blank lines.
3. Usage Notes. Where appropriate, notes regarding proper usage of systems to support the SDEF have been included in brackets ([]). These notes are included to assist users in creating SDEF compatible files, given the variety of software systems that support the SDEF.
4. Recommended Systems. Several systems have been tested to determine the accuracy of importing and exporting SDEF files. For information on the current list of recommended systems please contact Mr. Jeffrey Huneycutt at USACE, (912) 652-5129 (jeffrey.l.huneycutt@usace.army.mil). Although the currently listed system have bas tested other systems may also be acceptable provided those systems correctly import and export SDEF files.
5. Additional SDEF Information. Additional information related to SDEF can be found at <http://rms.usace.army.mil/QCS/Guides>. A file template, conversion utility, and P6 data field requirements are located here.

PART 2 SDEF SPECIFICATION

6. SDEF Organization. The SDEF must consist of the following records provided in the exact sequence shown below:

Paragraph Reference	Record Description	Remarks
a.	Volume Record	Mandatory First Line of File
b.	Project Record	Mandatory Second Line of File
c.	Calendar Record(s)	Mandatory One Record Minimum
d.	Holiday Record(s)	Mandatory if Holidays Used
e.	Activity Records(s)	Mandatory Records

Paragraph Reference	Record Description	Remarks
f.	Precedence Record(s)	Mandatory for Precedence
g.	Unit Cost Record(s)	Mandatory for Unit Costs
h.	Progress Record(s)	Mandatory Records
i.	File End Record	Mandatory Last Line of Disk/File

a. Volume Record. The Volume Record must be used to control the transfer of data that may not fit on a single disk. The first line in every file used to store SDEF data must be the Volume Record. The Volume Record must sequentially identify the number of the data transfer disk(s). The Volume Record must have the following format:

Description	Col Position	Max Length	Req Value	Type	Notes
Record Identifier	1 – 4	4	VOLM	Fixed	Filled
Disk Number	6 - 7	2	√	Number	R Justified

(1) The Record Identifier is the first four characters of this record. The required value for this field must be "VOLM". The VOLM record must appear on the first line of the SDEF data file.

(2) The Disk Number field must identify the number of the data disk used to store the data exchange information. If all data may be contained on a single disk, this field must contain the value of "1". If more disks are required, then the second disk must contain the value "2", the third disk must be designated with a "3", and so on. Identification of the last data disk is accomplished in the Reject End Record.

b. Project Record. The Project Identifier Record must contain general project information. Because more than one SDEF file may be required for data transfer between large projects, the PROJ record must be the second line of the first SDEF file transferred. The PROJ record must contain information in the following format:

Description	Col Position	Max Length	Req Value	Type	Notes
Record Identifier	1 – 4	4	PROJ	Fixed	Filled
Data Date	6 – 12	7	√	ddmmyy	Filled
Project Identifier	14 – 17	4	√	Alpha.	L Justified
Project Name	9 – 66	48	√	Alpha.	L Justified
Contractor Name	68 – 103	36	√	Alpha.	L Justified
Precedence	105	1	P	Fixed	Filled
Contract Number	107 – 112	6	√	Alpha.	L Justified
Project Start	114 – 120	7	√	ddmmyy	Filled
Project End	122 - 128	7	√	ddmmyy	Filled

(1) The Record Identifier is the first four characters of this record. The required value for this field must be "PROJ". This record must contain the general project information.

(2) The Data Date is the date of the schedule calculation. The abbreviation "ddmmmyy" refers to a date format that must translate a date into two numbers for the day, three letters for the month, and two numbers for the year. For example, March 1, 1999 must be translated into 01Mar99. This same convention for date formats must be used throughout the entire data format. To ensure that dates are translated consistently, the following abbreviations must be used for the three character month code:

Abbreviation	Month
Jan	January
Feb	February
Mar	March
Apr	April
May	May
Jun	June
Jul	July
Aug	August
Sep	September
Oct	October
Nov	November
Dec	December

(3) The Project Identifier is a maximum four character abbreviation for the schedule. These four characters must be used to uniquely identify the project and specific update as agreed upon by Contractor and Contracting Officer or Administrative Contracting Officer/Professional Engineer-in-Charge (ACO/AE/RE). When utilizing scheduling software these four characters must be used to select the project. Software manufacturers must provide information to users to ensure that data importing programs do not automatically overwrite other schedules with the same Project Identifier.

(4) The Project Name field must contain the name and location of the project edited to fit the space provided. The data appearing here must appear on scheduling software reports. The abbreviation "Alpha." refers to an "Alphanumeric" field value and must be used throughout the remainder of this specification.

(5) The Contractor Name field must contain the Construction Contractor's name, edited to fit the space provided.

(6) The Arrow or Precedence field must indicate which method must be used for calculation of the schedule. The value "A" must signify the Arrow Diagramming Method. The value "P" must signify the Precedence Diagramming Method. The activity ID field of the Activity Record

must be interpreted differently depending on the value of this field. The Precedence Record must be required if the value of this field is "P". [Usage Note: Software systems may not support both arrow and precedence diagramming. It is recommended that the selection of the type of network be based on the capabilities of the software used by project partners.]

(7) The Contract Number field must contain the contract number for the project. For example, the construction contract number W912DR-15-C-0001 must be entered into this field as "150001".

(8) The Project Start field must contain the date that the Contractor acknowledges the Notice to Proceed (NTP). [Usage Note: Software systems may use a project start date to constrain the first activity of a network. To ensure consistent scheduling calculations across products, it is recommended that the first activity in the schedule contain an early start constraint and a software system's project start date only be used to report on the project's start date.]

(9) The Project End field must contain the date that the Contractor plans to complete the work as stated in the contract and verified by the Contracting Officer or ACO/AE/RE. [Usage Note: Software systems may use a project end date to constrain the last activity of a network. To ensure consistent scheduling calculations across products, it is recommended that the last activity in the schedule contain an early start constraint and a software system's project end date only be used to report on the project's end date.]

c. Calendar Record. The Calendar Record(s) must follow the Project Identifier Record in the first disk of data transferred. A minimum of one Calendar Record must be required for all data exchange activity tiles. The format for the Calendar Record must be as follows:

Description	Col Position	Max Length	Req Value	Type	Notes
Record Identifier	1 - 4	4	CLDR	Fixed	Filled
Calendar Code	6	1	√	Alpha.	Filled
Workdays	8 - 14	7	SMTWTFS	Fixed	Filled
Calendar Description	16 - 45	30	√	Alpha.	L Justified

(1) The Record Identifier must always begin with "CLDR" to identify it as a Calendar Record. Each Calendar Record used must have this identification in the first four columns. [Usage Note: Systems contain a variety of calendar options. It is recommended that the least common denominator of calendar features between the systems be used as the basis for creating the SDEF file for a given project.]

(2) The Calendar Code must be used in the activity records to signify that this calendar is associated with the activity. [Usage Note: Some systems do not allow for alphanumeric calendar codes, but only allow positive integers from 1 to 9. It is recommended that only positive integers be used for the calendar code field to support the widest variety of scheduling systems.]

(3) The Workdays field must contain the work-week pattern selected with "Y", for Yes, and "N", for No. The first character must be Sunday and the last character Saturday. An example of a typical five (5) day work-week would be NYYYYYN. A seven (7) day work-week would be YYYYYYY.

(4) The Calendar Description must be used to briefly describe the calendar used.

d. Holiday Record. The Holiday Record(s) must follow the Calendar Record(s) in the first disk of data transferred. There may be calendars without any holidays designated or several Holiday Records for each Calendar Record(s). The format for the Holiday Record must be as follows:

Description	Col Position	Max Length	Req Value	Type	Notes
Record Identifier	1 – 4	4	HOLI	Fixed	Filled
Calendar Code	6	1	√	Alpha.	Filled
Holiday Date	8 – 14	7	√	ddmmyy	May be Filled
Holiday Date	16 – 22	7	√	ddmmyy	May be Filled
Holiday Date	24 – 30	7	√	ddmmyy	May be Filled
Holiday Date	32 – 38	7	√	ddmmyy	May be Filled
Holiday Date	40 – 46	7	√	ddmmyy	May be Filled
Holiday Date	48 – 54	7	√	ddmmyy	May be Filled
Holiday Date	56 – 62	7	√	ddmmyy	May be Filled
Holiday Date	64 – 70	7	√	ddmmyy	May be Filled
Holiday Date	72 – 78	7	√	ddmmyy	May be Filled
Holiday Date	80 – 86	7	√	ddmmyy	May be Filled
Holiday Date	88 – 94	7	√	ddmmyy	May be Filled
Holiday Date	96 – 102	7	√	ddmmyy	May be Filled
Holiday Date	104 – 110	7	√	ddmmyy	May be Filled
Holiday Date	112 – 118	7	√	ddmmyy	May be Filled
Holiday Date	120 – 126	7	√	ddmmyy	May be Filled

(1) The Record Identifier must always begin with "HOLI". Each Holiday Record used must have this identification in the first four columns.

(2) The Calendar Code indicates which work-week calendar the holidays must be applied to. More than one HOLI record may be used for a given calendar code.

(3) The Holiday Date must contain the date of each individual non-work day.

e. Activity Records. Activity Records must follow any Holiday Record(s). If there are no Holiday Record(s), then the Activity Records must follow the Calendar Record(s). There must

be one Activity Record for every activity in the network. Each activity must have one record in the following format:

Description	Col Position	Max Length	Req Value	Type	Notes
Record Identifier	1 – 4	4	ACTV	Fixed	Filled
Activity ID	6 – 15	10	√	Integer	See Comment
Activity Description	17 – 46	30	√	Alpha.	L Justified
Activity Duration	48 – 50	3	√	Integer	R Justified
Constraint Date	52 – 58	7		ddmmmyy	May be Filled
Constraint Type	60 – 61	2		ES or EF	May be Filled
Calendar Code	63	1	√	Alpha.	Filled
Hammock Code	65	1	Y, blank	Fixed	May be Filled
Workers per Day	67 – 69	3		Integer	Right Justified
Responsibility Code	71 – 74	4		Alpha.	Left Justified
Work Area Code	76 – 79	4		Alpha.	Left Justified
Mod of Claim No.	81 – 86	6		Alpha.	Left Justified
Bid Item	88 – 93	6		Alpha.	Left Justified
Phase of Work	95 – 96	2		Alpha.	Left Justified
Category of Work	98	1		Alpha.	May be Filled
Feature of Work	100 – 128	10		Alpha.	Left Justified

(1) The Record Identifier for each activity description record must begin with the four character "ACTV" code.

(2) The Activity ID consists of a right-justified field of ten (10) integers each. The maximum activity number allowed under this arrangement is 9999999999.

(3) The Activity Description must be a maximum of 30 characters. Descriptions must be limited to the space provided.

(4) The Activity Duration contains the estimated original duration for the activity on the schedule. The duration must be based upon the work-week designated by the activity's related calendar.

(5) The Constraint Date field must be used to identify a date that the scheduling system may use to modify float calculations. If there is a date in this field, then there must be a valid entry in the constraint type field.

(6) The Constraint Type field must be used to identify the way that the scheduling system must use the constraint date to modify schedule float calculations. If there is a value in this field, then there must be a valid entry in the constraint date field. The valid values for the constraint type are as follows:

Code	Definition
ES	The constraint date must replace an activity's early start date, if the early start date is prior to the constraint date.
LF	The constraint date must replace an activity's late finish date if the late finish date is after the constraint date.

(7) The Calendar Code relates this activity to an appropriate work-week calendar. The activity duration must be based on the valid work-week referenced by this calendar code field.

(8) The Hammock Code (level of effort in P6) indicates that a particular activity does not have its own independent duration, but takes its start dates from the start date of the preceding activity and takes its finish dates from the finish dates of its succeeding activity. If the value of the hammock code field is "Y", then the activity is a hammock activity.

(9) The Workers per Day must contain the average number of workers expected to work on the activity each day the activity is in progress. If this code is required by project scheduling specifications, values for this data will be right justified. Activities without workers per day must have a value of "0".

(10) The Responsibility Code must identify the subcontractors or major trade involved with completing the work for the activity. If this code is required by project scheduling specifications, values for this data will be left justified.

(11) The Work Area Code must identify the location of the activity within the project. If this code is required by project scheduling specifications, value for this data will be left justified.

(12) The Mod or Claim Number must uniquely identify activities that are added or changed on a construction contract modification, or activities that justify any claimed time extensions. If this code is required by project scheduling specifications, value for this data will be left justified.

(13) The Bid Item must identify the bid item number associated with each activity. If this code is required by project scheduling specifications, value for this data will be left justified.

(14) The Phase of Work must identify the timing of a specific activity within the entire project. If this code is required by project scheduling specifications, value for this data will be left justified.

(15) The Category of Work must identify the general type of work performed by every activity. If this code is required by project scheduling specifications.

(16) The Feature of Work must identify a very broad designation of the general type of work that is being accomplished by the activity. If this code is required by project scheduling specifications, value for this data will be left justified. Features of work will typically match those shown in the Contractor Quality Control Plan. [Usage Note: Some systems may require that feature of work values be placed in several activity code fields. It is recommended that users review SDEF documentation to determine the correct way to use a given software system to produce the feature of work code.]

f. Precedence Record. The Precedence Record(s) must follow the Activity Records. The Precedence Record has the following format:

Description	Col Position	Max Length	Req Value	Type	Notes
Record Identifier	1 - 4	4	PRED	Fixed	Filled
Activity ID	6 - 15	10	√	Integer	See Comment
Preceding Activity	17 - 26	10	√	Integer	See Comment
Predecessor Type	28	1	√	S, F, C	Filled
Lag Duration	30 - 33	4	√	Integer	Right Justified

(1) The Record Identifier must begin with the four characters "PRED" in the first four columns of the record.

(2) The Activity ID identifies the activity whose predecessor must be identified in this record.

(3) The Preceding Activity number is the number of an activity that precedes the activity noted in the activity ID field.

(4) The Predecessor Type field indicates the type of relation that exists between the chosen pair of activities. Valid predecessor type fields are as follows:

Code	Definition
S	Start-to-Start relation
F	Finish-to-Finish relation
C	Finish-to-Start relation

[Usage Note: Some systems provide additional predecessor types that may not be supported by all other systems. It is recommended that predecessor types be restricted to the values above regardless of the capabilities of the various systems being used for scheduling.]

(5) The Lag Duration field contains the number of days delay between the preceding and current activity. [Usage Note: Some systems allow negative values for the lag duration. Because these values are not supported by all other systems, it is recommended that values be restricted to zero and positive integers.]

g. Unit Cost Record. The Unit Cost Record must follow all Precedence Records. There must be one Unit Cost Record for every activity that is not lump sum activity. [Usage Note: (1) It is recommended that users who wish to exchange unit cost data contact SDEF vendor representatives to determine the ability of the software system to import/export unit cost information. (2) If the software being used by each member of the project team supports unit cost data then users may wish to conduct a trial run of the SDEF data exchange with a two or three activity network to ensure that unit cost data transfers as expected. If problems are found please consult vendor representatives for resolution prior to exchange of full project schedules. (3) Unit cost record data does not, in most systems, result in the correct values being placed in the activity cost and cost to date fields of the Progress (PROG) Record. Users must, at this time, manually transfer the data from the Unit Cost Record to the Progress Record.] The fields for this record must take the following format:

Description	Col Position	Max Length	Req Value	Type	Notes
Record Identifier	1 - 4	4	UNIT	Fixed	Filled
Activity ID	6 - 15	10	√	Integer	See Comment
Total QTY	17 - 29	13	√	Format 8.4	Right Justified
Cost per Unit	31 - 43	13	√	Format 8.4	Right Justified
QTY to Date	45 - 57	13	√	Format 8.4	Right Justified
Unit of Measure	59 - 61	3	√	Alpha.	Left Justified

(1) The Record Identifier must be identified with the four characters “UNIT” placed in the first four columns of the record.

(2) The Activity ID for each activity must match the format described in the activity record. Each activity may have only one Unit Cost Record.

(3) The Total QTY is the total amount of material to be used in this activity. This number consists of eight digits, one decimal point and four more digits. An example of a number in this format is "11111111.1111". If decimal places are not needed this field must still contain a ".0000" in columns 25-29. [Usage Note: Some systems support a different format for this value that does not include as many decimal places. It is recommended that users determine their requirements for significant digits based on the lowest common denominator of the software systems being used for a given project.]

(4) The Cost per Unit is the cost, in dollars and cents, for each unit to be used in this activity. This number consists of eight digits, one decimal point, and four more digits. An example of a number in this format is "11111111.1111". If decimal places are not needed, this field must still contain a ".0000" in columns 39-43. [Usage Note: Some systems support a different format for this value that does not include as many decimal places. It is recommended that users determine their requirements for significant digits based on the lowest common denominator of the software systems being used for a given project.]

(5) The QTY to Date is the quantity of material installed in this activity up to the data date. This number consists of eight digits, one decimal point, and four more digits. An example of a number in this format is "11111111.1111". If decimal places are not needed this field must still contain a ".0000" in columns 53-57. [Usage Note: Some systems support a different format for this value that does not include as many decimal places. It is recommended that users determine their requirements for significant digits based on the lowest common denominator of the software systems being used for a given project.]

(6) The Unit of Measure is an abbreviation that may be used to describe the units being measured for this activity. Valid values for this field are any meaningful English or metric unit, except "LS" for Lump Sum. Lump Sum activities are not to have Unit Cost Records.

h. Progress Record. Progress Record(s) must follow all Unit Cost Record(s). If there are no Unit Cost Record(s), then the Progress Record(s) must follow all Precedence Records. One Progress Record is required for every activity in the Activity Record. The fields for this Record must be provided in the following format:

Description	Col Position	Max Length	Req Value	Type	Notes
Record Identifier	1 – 4	4	PROG	Fixed	Filled
Activity ID	6 – 15	10	√	Integer	See Comment
Actual Start Date	17 – 23	7	√	ddmmyy	Filled if Started
Actual Finish Date	25 – 31	7	√	ddmmyy	Filled if Finished
Remaining Duration	33 – 35	3	√	Integer	Right Justified
Activity Cost	37 – 48	12	√	Format 9.2	Right Justified
Cost to Date	50 – 61	12	√	Format 9.2	Right Justified
Stored Material	63 – 74	12	√	Format 9.2	Right Justified
Early Start Date	76 – 82	7	√	ddmmyy	Filled if Not Started
Early Finish Date	84 – 90	7	√	ddmmyy	Filled if Not Finished
Late Start Date	92 – 98	7	√	ddmmyy	Filled if Not Started
Late Finish Date	100 – 106	7	√	ddmmyy	Filled if Not Finished
Float Sign	108	1	+, -√	Fixed	Filled if Not Finished
Total Float	110 - 112	3	√	Integer	R Just. If not Finished

(1) The Record Identifier must begin with the four characters "PROG" in the first four columns of the record.

(2) The Activity ID for each activity for which progress has been posted must match the format described in the Activity Record.

(3) An Actual Start Date is required for all in-progress activities. The actual start date must be the same as, or later than, the project start date contained in the Project Record. The actual start date must also be the same as, or prior to, the data date contained in the Project Record. If

there is an actual start date for an activity; there must also be a remaining duration, and the values for the early start date and late start date are blank. [Usage Note: Some systems allow default values for actual start date if the date is not entered by the user. Because the failure to include a start date for activities may result in different schedule calculations, it is recommended that the actual start date be required for all activities in progress.]

(4) An Actual Finish Date is required for all completed activities. If the remaining duration of an activity is zero, then there must be an actual finish date. If there is an actual finish date, then values for the early start date, late start date, early finish date, late finish date, float sign, and total float must be blank. [Usage Note: Some systems allow default values for actual finish date if the date is not entered by the user. Because the failure to include a finish date for activities may result in different schedule calculations, it is recommended that the actual finish date be required for all activities in progress.]

(5) A Remaining Duration is required for all activities. Activities that have not started must have a remaining duration equal to their original duration. Activities completed based on time, must have a zero (0) remaining duration. [Usage Note: Systems have a variety of "short-cut" methods to determine the remaining duration value. It is recommended that users actually consider the time required to complete the remaining work on a given task, rather than allow a system to calculate the remaining duration based on the amount of work that has already been accomplished.]

(6) The Activity Cost contains the estimated earned value of the work to be accomplished in the activity. An example of a number in this format is "11111111.11". If decimal places are not needed this field must still contain a ".00" in the last three columns of this field. [Usage Note: Users should inquire of software vendors if the user needs to add a zero in the data field to produce the default value "0.00".]

(7) The Cost to Date contains the earned value for the activity. If there is an actual start date, then there must also be some value for cost to date. An example of a number in this format is "11111111.11". If decimal places are not needed, this field must still contain a ".00" in the last three columns of this field. The cost to date is not tied to remaining duration. For example, if the remaining duration is "0", the cost to date may only be 95% of the activity cost. This difference may be used to reflect 5% retainage for punch list items. [Usage Note: Systems implement cost information in different ways. It is recommended that users carefully review SDEF documentation and test results to determine how to ensure that SDEF data is exported correctly.]

(8) The Stored Material field contains the value of the material that the Contractor has paid for and is on site or in secure storage areas that is a portion of the cost to date. An example of a number in this format is "11111111.11". If decimal places are not needed, this field must still contain a ".00" in the last three columns of this field. [Usage Note: Systems implement the stored materials field in a variety of ways. Many systems do not enforce stored material + cost

to date < activity cost. To avoid potential confusion between systems, it is recommended that new activities be added to a schedule to reflect the cost of large equipment procurement rather than use the STORED MATERIALS field.]

(9) The Early Start Date indicates the earliest date possible that an activity can start as calculated by a CPM scheduling system or other Chief of Construction approved planning method. If the progress record for an activity contains an actual start date, then this field must be blank.

(10) The Early Finish Date indicates the earliest date possible that an activity can finish as calculated by a CPM scheduling system or other Chief of Construction approved planning method. If a prior progress record for an activity contains an actual finish date, then this field must be blank.

(11) The Late Start Date indicates the latest date that an activity can begin as calculated by a CPM scheduling system or other Chief of Construction approved planning method. If the progress record for an activity contains an actual start date, then this field must be blank.

(12) The Late Finish Date indicates the latest date that an activity can finish as calculated by a CPM scheduling system or other Chief of Construction approved planning method. If the progress record for an activity contains an actual finish date, then this field must be blank.

(13) The Float Sign indicates whether the float time calculated using a CPM scheduling system or other Chief of Construction approved planning method, is positive or negative in nature. If the progress record for an activity contains an actual finish date, then this field must be blank. In the case of zero float this field must be blank.

(14) The Total Float indicates the total float time. The total float is the difference between the early and late start or finish dates.

i. Project End Record. The Project End Record must be used to identify that the data file is completed. If the ASCII End of File character is encountered, then data import programs must use that character to infer that the data continues on the next disk rather than using it as a Project End Record. The user must then be prompted for the next disk number, based on the VOLM record data. The Project End Record must be the last record of the entire data file, and must have the following format:

Description	Col Position	Max Length	Req Value	Type	Notes
Record Identifier	1 - 3	3	END	Fixed	Filled

(1) The Record Identifier for the Project End Record must be "END". Data contained in the data exchange file that occurs after this record must not be used.